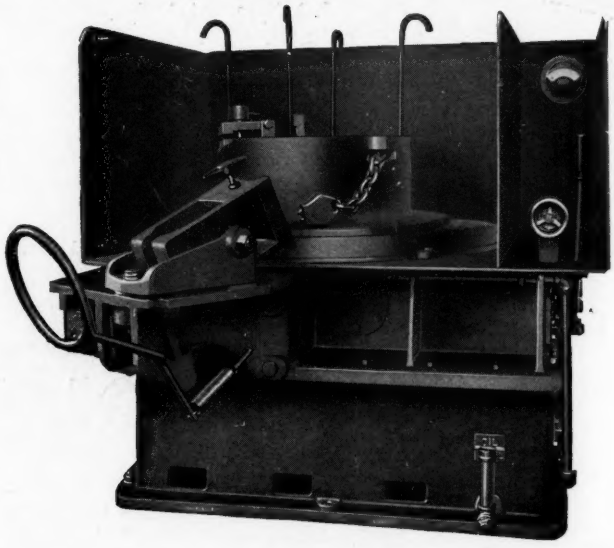
WIRE
& WIRE PRODUCTS

VAUGHN (LARGE SIZE) MOTOBLOCS

For every wire drawing requirement there is a type and size Motobloc exactly fitted for the job.



We also manufacture a complete line of continuous copper wire drawing machines, draw-benches for bars, and other machinery for wire mills

Just a few of the many advantages of Large Size Motoblocs over Horizontal Bull Blocks

¶ Requires less floor space for a given production.

¶ Insures better handling conditions because block strippers can be used and material thus kept off the floor.

¶ Individual Drive and Control for each block permits more efficient production of different sizes on different machines at the same time.

VAUGHN MACHINERY COMPANY
CUYAHOGA FALLS, OHIO
Export Office: 420 Lexington Avenue, New York, N. Y.

Speed Production with CARBOLOY DIES

TRADE MARK REG.

CARBOLOY cemented tungsten carbide, the diamond-like hard alloy which has proven so revolutionary in the cutting tool industry is now available for drawing and extrusion dies.

Carboloy Dies are supplied in complete form or nib blanks with rough cored hole size. The blanks may be mounted in a casing or holder.

If you have die or tool room facilities and are conversant with the use of diamond powder your own men can form hole shapes, contours and hole sizes without difficulty.

Dies can be supplied from 0.010″ to 0.75″.

In order to facilitate the handling of inquiries forward us the following:

1. Kind of material to be drawn.
2. Draft from rod to desired finished size.
3. Tensile strength of material.
4. Lubricant used.
5. Blueprint or sketch of hole or better a sample of die now being used.
6. Speed in feet per minute at which wire is drawn.

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Speed Production with CARBOLOY

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Wilhelm Breitenbach

Machine Works and Foundry

OF UNNA, WESTFALIA, GERMANY

FOUNDED: 1863 **FOUNDED: 1863**

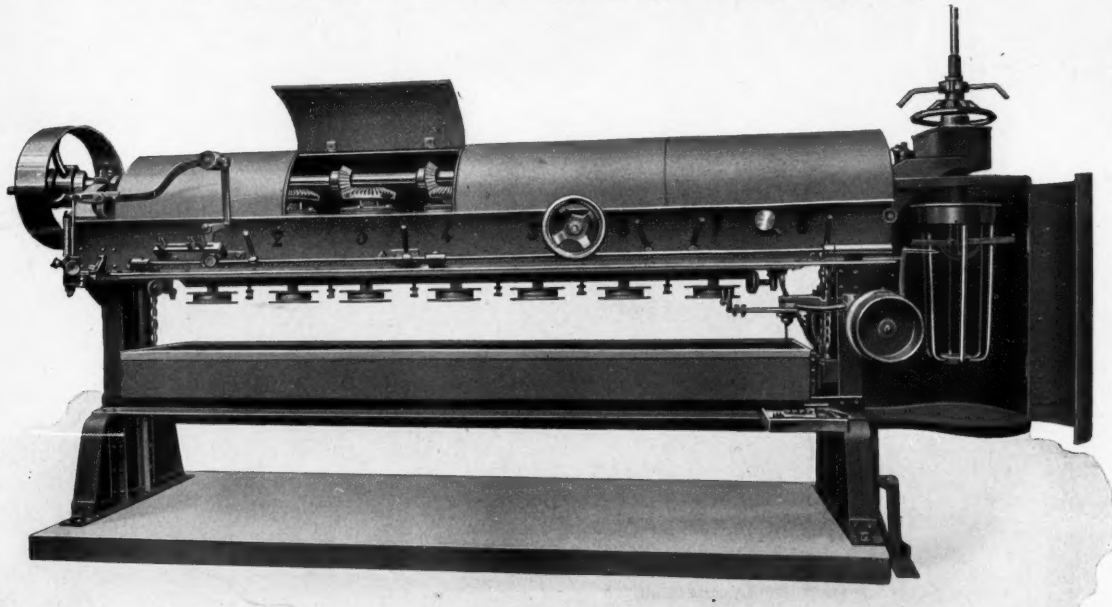
SPECIALISTS IN WIRE FORMING MACHINERY

I—PATENTED FRICTION DRAWING BENCHES of standard and special construction for light and heavy draft. Outstanding features are: spiral spring friction clutch of special design; patented spindle-gear on ball-bearings, all enclosed in oil filled casing.

II—BENCHES FOR THE DRAWING OF LIGHT AND CARD WIRE of standard and special construction.

Of Exceptional Interest Are:

1—Light and Card Wire Benches with spiral spring friction clutch for special wire.
2—Light and Card Wire Benches with instantaneous disengaging coupling.
3—Card Wire Benches with built in spooling apparatus for Rope Wire.



III—PATENTED MULTIPLE DRAWING BENCHES for Iron Wire of from 3.5 mm. dia. Drawing drums and drawing stones fully submerged in cooling drawing liquid while machine is in operation. The output of 1000 kilogr. of from 0.8 to 2.2 mm. dia. iron-wire per man per day (eight hours) is unsurpassed.

IV—SPOOLING APPARATUS equipped with individual driving gears for the Annealing and zincing of Steel Wire. All dimensions.

V—SPEED WINDLES for the respooling of zinced wire. Apparatus for Wire Washing, Spraying, etc., etc.

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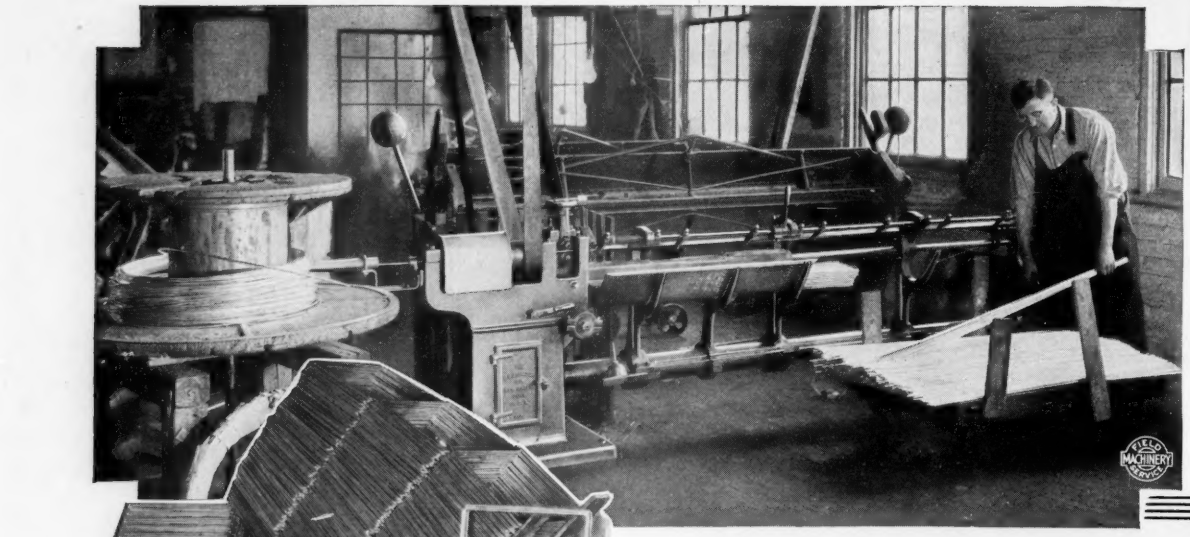

The wire on and leaning against the truck has just been straightened and cut on the Shuster. In the rear are some of the 56¼" pieces that have been bent into shape. At the left are finished oven racks—made from wire cut on the Shuster machine.

Saving 10%!

A Shuster Wire Straightening and Cutting-off Machine is shown here straightening No. 6 tinned wire 3/16" diameter and cutting it into 56¼" lengths. Shuster efficiency has resulted in a saving of 10% in time and material on this operation. It has effected similar economies on Nos. 9 and 3 tinned wire and Nos. 14 and 16 gage core wire.

The owners of this machine, the George D. Roper Corp. of Rockford, Illinois, manufacture gas and electric ranges, gas furnaces and pumps on a large scale, and the savings the Shuster has accomplished in its two years of service has brought forth the following recommendation from them:

"Very good! Simple in construction and operation — needs no maintenance."

All details gladly sent upon request.

THE F. B. SHUSTER COMPANY

NEW HAVEN, CONN.

Straightener Specialists Since 1866

THE great need for standardization of wire gage systems is expressed in a letter received by the technical committee of The American Standards Association on wire and sheet metal gages from Professor Townsend of the Massachusetts Institute of Technology. Professor Townsend says in part:

* * *

"An informal canvass of my associates indicates that almost any consolidating change in the existing gages would be far more desirable than the present state of affairs. They seem to feel that the expression of sheet and wire sizes by the decimal sizes, alone, would be the first logical step. After that overlapping sizes in the various systems (especially when the tolerances are considered) would be more or less automatically eliminated.

* * *

"The general feeling among the electrical engineers is that it would be very desirable from their standpoint to have the wire in sizes which would give even units of circular mils. However, this idea has been mentioned as unimportant when compared to the major question of establishing a new and simple wire gaging system. Several suggestions have been made to this effect: One sheet metal gage such as the U. S. Standard, and one for wire such as B & S or American gage."

* * *

The informed and interested readers of *Wire & Wire Products* who have opinions or ideas about gage standardization—a subject that is bound to have far reaching implications for their industries—are urged to communicate with the technical committee now studying the project. The address of the American Standards Association is 29 West 39th Street, New York City.

The Publishers

WIRE & WIRE PRODUCTS

A monthly publication devoted to wire drawing and wire forming

Vol. 4 **June, 1929** **No. 6**

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A PROVEN PRODUCT

Specialization makes for progress
We make dies exclusively

Un-Widia Alloy Dies are the result of the collaboration of the world's best known makers of special alloys, Fried, Krupp Co., and America's largest wire and tube die manufacturers, the Union Wire Die Corporation.

Un-Widia dies are showing in numerous mills on copper, steel, nickel, aluminum, gold, silver and their alloys,

Reduced rejection percentages
Reduced manufacturing costs
Increased production.

THE KRUPP PRODUCT
Widia metal is made into dies
and sold exclusively in the
UNITED STATES, CANADA and FRANCE
BY

UNION WIRE DIE CORPORATION

NEW YORK

WIRE
& WIRE PRODUCTS

Vol. 4 JUNE, 1929 No. 6

Proposed Tariff Act Will Affect Numerous Classifications of Wire and Wire Products

Note: Differences between the present Tariff Act of 1922 and the new bill are shown in the following excerpts from the official text by printing the new rates and new language in italics. Old rates and language stricken out of the present law are inclosed in brackets.

IN the House of Representatives, May 7, Mr. Hawley introduced the bill (H. R. 2667) from which the following excerpts were taken. The bill was referred to the Committee on Ways and Means and reported on May 9 to the House by a vote of 15 to 9. The official text describes it as

A Bill

To provide revenue, to regulate commerce with foreign countries, to encourage the industries of the United States, to protect American labor, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

Title 1—Dutiable List.

Section 1. That on and after the day following the passage of this Act, except as otherwise specially provided for in this Act, there shall be levied, collected, and paid upon all articles when imported from any foreign country into the United States or into any of its possessions (except the Philippine Islands, the Virgin Islands, and the islands of Guam and Tutuila) the rates of duty which are prescribed by the schedules and paragraphs of the dutiable list of this title, namely:

[Matter stricken is inclosed in brackets; new matter is in italic].

Wire Rods

Par. 315. Wire rods: Rivet, screw, fence, and other iron or steel wire rods, whether round, oval, or square, or in any other shape, nail rods and flat rods up to six inches in width ready to be drawn or rolled into wire or strips, all the foregoing in coils or otherwise, valued at not over 4 cents per pound, three-tenths of 1 cent per pound; valued at over 4 cents per pound, [six-tenths of 1 cent per pound] *20 per centum ad valorem*: *Provided*, That all round iron or steel rods smaller than twenty one-hundredths of one inch in diameter shall be classified and dutiable as wire: *Provided further*, That all iron or steel rods which have been tempered or treated in any manner or partly manufactured shall [pay] *be subject to* an additional duty of one-fourth of 1 cent per pound: *Provided further*, That on all iron or steel bars and rods of whatever shape or section which are cold rolled, cold drawn, cold hammered, or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid one-eighth of 1 cent per pound in addition to the rates provided on bars or rods of whatever section or shape which are hot rolled; and on all strips, plates, or sheets of iron or steel of whatever shape, other than polished, planished, or glanced sheet iron or sheet steel, which are cold hammered, blued, brightened, tempered, or polished by any process to such perfected surface finish or polish better than the grade of cold rolled, smoothed only, there shall be paid two-tenths of 1 cent per pound in addition to the rates provided on plates, strips, or sheets of iron or steel of common or black finish of corresponding thickness or value.

Iron and Steel Wire

Par. 316. Round iron or steel wire, not smaller than ninety-five one-thousandths of one inch in diameter, three-fourths of 1 cent per pound; smaller than ninety-five one-thousandths and not smaller than sixty-five one-thousandths of one inch in diameter, 1¼ cents per pound; smaller than sixty-five one-thousandths of one inch in diameter, 1½ cents per pound: *Provided*,

That all [of] the foregoing valued above 6 cents per pound shall [pay] *be subject to* a duty of 25 per centum ad valorem; all wire composed of iron, steel, or other metal, [nor] *not* specially provided for (except gold, silver, or platinum); all flat wires and all steel in strips not thicker than one-quarter of one inch and not exceeding sixteen inches in width, whether in long or short lengths, in coils or otherwise, and whether rolled or drawn through dies or rolls, or otherwise produced, 25 per centum ad valorem: *Provided*, that all wire of iron, steel, or other metal coated by dipping, galvanizing, sherardizing, electrolytic, or any other process with zinc, tin, or other metal, shall [pay] *be subject to* a duty of two-tenths of 1 cent per pound in addition to the rate imposed on the wire of which it is made; telegraph, telephone, and other wires and cables composed of iron, steel, or other metal (except gold, silver, or platinum), covered with or composed in part of cotton, jute, silk, enamel, lacquer, rubber, paper, compound, or other material, with or without metal covering, 35 per centum ad valorem; wire rope, *40 per centum ad valorem;* [and] wire strand, 35 per centum ad valorem; spinning and twisting ring travelers, 35 per centum ad valorem; wire heddles and healds, 25 cents per thousand and 30 per centum ad valorem.

Galvanized Wire and Wire Cloth

Par. 317. All galvanized wire not specially provided for, not larger than twenty one-hundredths and not smaller than eight one-hundredths of one inch in diameter, of the kind commonly used for fencing purposes, galvanized wire fencing composed of wires not larger than twenty one-hundredths and not smaller than eight one-hundredths of one inch in diameter; and all wire commonly used for baling hay or other commodities, one-half of 1 cent per pound.

Par. 318. Woven-wire cloth: Gauze, fabric, or screen, made of wire composed of steel, brass, copper, bronze, or any other metal or alloy, not specially provided for, with meshes not finer than thirty wires to the lineal inch in warp or filling, 25 per centum ad valorem; with meshes finer than thirty and not finer than ninety wires to the lineal inch in warp or filling, [35] *40* per centum ad valorem; with meshes finer than ninety wires to the lineal inch in warp or filling, [45] *50* per centum ad valorem. *Fourdrinier wires and cylinder wires, suitable for use in paper-making machines (whether or not parts of or fitted or attached to such machines), and woven-wire cloth suitable for use in the manufacture of Fourdrinier wires or cylinder wires, 55 per centum ad valorem.*

Chains

Par. 329. Chain and chains of all kinds, made of iron or steel, not less than three-fourths of one inch in diameter, seven-eighths of 1 cent per pound; less than three-fourths and not less than three-eighths of one inch in diameter, 1⅛ cents per pound; less than three-eighths and not less than five-sixteenths of one inch in diameter, 2⅛ cents per pound; less than five-sixteenths of one inch in diameter, 4 cents per pound; [sprocket and machine chains,] *chains* of iron or steel, *used for the transmission of power, of not more than two-inch pitch and containing more than three parts per pitch,* and parts thereof *finished or unfinished, 40 per centum ad valorem; all other chains used for the transmission of power, and parts thereof,* 35 per centum ad valorem; anchor or stud link chain, two inches or more in diameter, 1½ cents per pound; less than two inches in diameter, 2 cents per pound: *Provided*, That all articles manufactured wholly or in chief value of chain shall not [pay] *be subject to* a lower rate of duty than that imposed upon the chain of which it is made, or of which chain is the component material of chief value.

Nails

Par. 331. Cut nails and cut spikes, of iron or steel, exceeding two inches in length, four-tenths of 1 cent per pound; cut tacks and brads, hobnails and cut nails, of iron or steel, not exceeding two inches in length, 15 per centum ad valorem; horseshoe nails, and other iron or steel nails, not specially provided for, 1½ cents per pound; *upholsterers' nails, chair glides, and thumb tacks, of two or more pieces of iron or steel, finished or unfinished, 3 cents per pound;* nails, spikes, tacks, brads, and staples, made of iron or steel wire, not less than one inch in length nor smaller than sixty-five one-thousandths of one inch in diameter, four-tenths of 1 cent per pound; less than one inch in length and smaller than sixty-five one-thousandths of one inch in diameter, three-fourths of 1 cent per pound; spikes, tacks, brads, and staples, not specially provided for, six-tenths of 1 cent per pound.

Card Clothing

Par. 337. Card clothing not actually and permanently fitted to and attached to carding machines or to parts thereof at the time of importation, when manufactured with round iron or untempered round steel wire, 20 per centum ad valorem; when manufactured with tempered round steel wire, or with plated wire, or with felt face, wool face, or rubber-face cloth containing wool, 45 per centum ad valorem.

Screws and Pins

Par. 338. Screws, commonly called wood screws, of iron or steel, 25 per centum ad valorem.

Par. 350. Pins with solid heads, without ornamentation, including hair, safety, hat, bonnet, and shawl pins; and brass, copper, iron, steel or other base metal pins, with heads of glass, paste, or fusible enamel; all the foregoing not plated with gold or silver, and not commonly known as jewelry, 35 per centum ad valorem.

Tinsel Wire

Par. 385. Tinsel wire, made wholly or in chief value of gold, silver, or other metal, 6 cents per pound and [10] *20* per centum ad valorem; lame or lahn,

made wholly or in chief value of gold, silver, or other metal, 6 cents per pound and [20] *30* per centum ad valorem; bullions and metal threads made wholly or in chief value of tinsel wire, lame or lahn, 6 cents per pound and [35] *45* per centum ad valorem; beltings, [toys,] and other articles made wholly or in chief value of tinsel wire, metal thread, lame or lahn, or of tinsel wire, lame or lahn and india rubber, bullions, or metal threads, not specially provided for, [45] *55* per centum ad valorem; woven fabrics, ribbons, fringes, and tassels, made wholly or in chief value of any of the foregoing, [55] *65* per centum ad valorem.

Umbrella Wire

Par. 342. Umbrella and parasol ribs and stretchers, composed wholly or in chief value of iron, steel, or other metal, in frames or otherwise, and tubes for umbrellas, wholly or partly finished, (50) *60* per centum ad valorem.

Needles

Par. 343. (Spring-beard needles, and other needles) *Needles* for knitting, sewing, shoe, or embroidery machines of every description, not specially provided for, (and crochet needles,) $1.15 per thousand and 40 per centum ad valorem; *spring-beard needles and crochet needles or hooks, $1.50 per thousand and 50 per centum ad valorem;* latch needles, $2 per thousand and (50) *60* per centum ad valorem; tape, knitting, and all other needles, not specially provided for, bodkins of metal, and needle cases or needle books furnished with assortments of needles or combinations of needles and other articles, (45) *50* per centum ad valorem.

Electrical Equipment

Par. 353. *All articles suitable for producing, rectifying, modifying, controlling, or distributing electrical energy; electrical telegraph, telephone, signalling, radio, welding, ignition, wiring, theropeutic, and X-ray apparatus, instruments, and devices; and articles having as an essential feature an electrical element furnaces, heaters, ovens, ranges, washing machines, refrigerators, and signs; all the foregoing, and parts thereof, finished or unfinished, wholly or in chief value of metal, and not specially provided for, 40 per centum ad valorem.*

Scientific Instruments

Par. 360. Philosophical, scientific, and laboratory instruments, apparatus, utensils, appliances (including drawing, surveying, and mathematical instruments), and parts thereof, (composed) wholly or in chief value of metal, and not plated with gold, silver, or platinum, finished or unfinished, not specially provided for, 40 per centum ad valorem: *Provided,* That all articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the outside, or if a jointed instrument on the outside when closed.

Pliers and Nippers

Par. 361. *Slip joint Pliers, 60 per centum ad valorem; other* (Pliers) *pliers,* pincers, and (nippers) *nippers of* all kinds, *and hinged hand tools for holding and splicing wire, finished* or unfinished, *valued at not more than $2 per dozen, 10 cents each and 60 per centum ad valorem; valued at more than $2 per dozen, 20 cents each and* 60 per centum ad valorem: *Provided,* that all articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the outside of the joint.

Copper and Brass Rod

Par. 381. Copper in rolls, rods, or sheets, 2½ cents per pound; brass rods, sheet brass, brass plates, bars, and strips, Muntz or yellow metal sheets, sheathing, bolts, piston rods, and shafting, 4 cents per pound; bronze rods and sheets, 4 cents per pound.

Steel Wool

Par. 334. Steel wool, 10 cents per pound; steel shaving, 5 cents per pound; and in addition thereto, on all [of] the foregoing, 30 per centum ad valorem.

Aluminum

Par. 374. Aluminum, aluminum scrap, and alloys [of any kind] (*except those provided for in paragraph 302*) in which aluminum is the component material of chief value, in crude form, 5 cents per pound; in coils, plates, sheets, bars, rods, circles, disks, blanks, strips, rectangles, and squares, 9 cents per pound.

Phosphor-Copper

Par. 388. Phosphor-copper or phosphorus-copper, 3 cents per pound.

Par. 389. New types, [20] *30* per centum ad valorem.

Ore Concentrates and Alloy Metals

Par. 302. (*a*) Manganese ore or concentrates containing in excess of 30 per centum of metallic manganese, 1 cent per pound on the metallic manganese contained therein.

(*b*) Molybdenum ore or concentrates, 35 cents per pound on the metallic molybdenum contained therein.

(*c*) Tungsten ore or concentrates, [45] *50* cents per pound on the metallic tungsten contained therein.

(*d*) Ferromanganese containing more than 1 per centum of carbon, 1⅞ cents per pound on the metallic manganese contained therein: *Provided,* That ferromanganese for the purposes of this Act shall be such iron manganese alloys as contain 30 per centum or more of manganese.

(*e*) Manganese metal, manganese silicon, manganese boron, and ferromanganese and spiegeleisen containing not more than 1 per centum of carbon, 1⅞ cents per pound on the manganese contained therein and 15 per centum ad valorem.

(*f*) Ferromolybdenum, metallic molybdenum, molybdenum powder, calcium molybdate, and

(*Please turn to page 208*)

The Triumph of American Music Wire

The development of supremacy in a highly specialized field confirms the vision and enterprise of pioneer manufacturers

General view of Acoustic Laboratory, American Steel & Wire Co.

IN the modern piano there are over two hundred and twenty parts formed from round and flat wire. By far the most important wire item in the instrument, of course, is music wire itself—the term embracing the highly specialized steel wire for pianos, mandolins, guitars and banjos, the E strings of violins and so on. The output in terms of tonnage is small, for a ton of piano wire of mean diameter will run to about seventy miles of length, but it is doubtful if any other wire or wire product requires more accuracy, care and skill in production to insure uniformity in every inch.

When the steel wire strings in a grand piano are pulled up to pitch and the instrument is in turne, these wires are stretched with an aggregate strain of from 18 to 25 tons, which is sustained by the iron frame of the piano day in and day out. The strings range in length from 2 inches to 72 inches (plain steel wire) and from 36 to 84 inches in copper-wound wires. Once in position each has a very definite function to perform, involving an intricate blending of the accumulated contributions of the metallurgist and physicist, manufacturer and musician.

Properly drawn piano wire—(and whatever is not up to the exacting requirements is used for springs)—must not only have absolute uniformity, but tensile strength without extreme hardness and a tough, fibrous composition that when cut or broken shows a clean, white, sweet steel. To quote some of its requirements in terms of music rather than of wire drawing, "it must vibrate so evenly throughout when actuated by the proper amount of energy that the true fundamental tone, with just enough of the Octave to give brilliance, the Fifth to give mellowess, and of the Third and Sixth to give richness, will be amplified by the sounding board".

The result is "American Tone", a distingushing characteristic of an importance that will become more evident later on in these notes. In the face of such varied and exacting requirements it is not surprising that the largest domestic manufacturers of music wire, the American Steel & Wire Comany, maintain an elaborately equipped acoustic laboratory in Chicago for the study of every element that enters into the making and use of the product. As will be seen presently, many of the instruments, methods and devices employed for the purpose represent the most advance contributions to laboratory technique.

The development of the supremacy of American made piano wire has accompanied the developments of the piano as we know the instrument today—both due in no small part to the

Table of Gage, Diameter and Weight
Showing Gage, Diameter in Decimals and Inch and Weight in Grains per Inch of American Piano Wire.

Gage	Diam.	Wt. Grs.
11	.026	1.0649
11½	.0275	1.1723
12	.029	1.3530
12½	.030	1.4211
13	.031	1.5125
13½	.032	1.5860
14	.033	1.7143
14½	.034	1.8168
15	.035	1.9351
15½	.036	2.0198
16	.037	2.17565
16½	.038	2.2719
17	.039	2.3809
17½	.040	2.4783
18	.041	2.6075
19	.043	2.7963
20	.045	3.1645
21	.047	3.4259
22	.049	3.78025

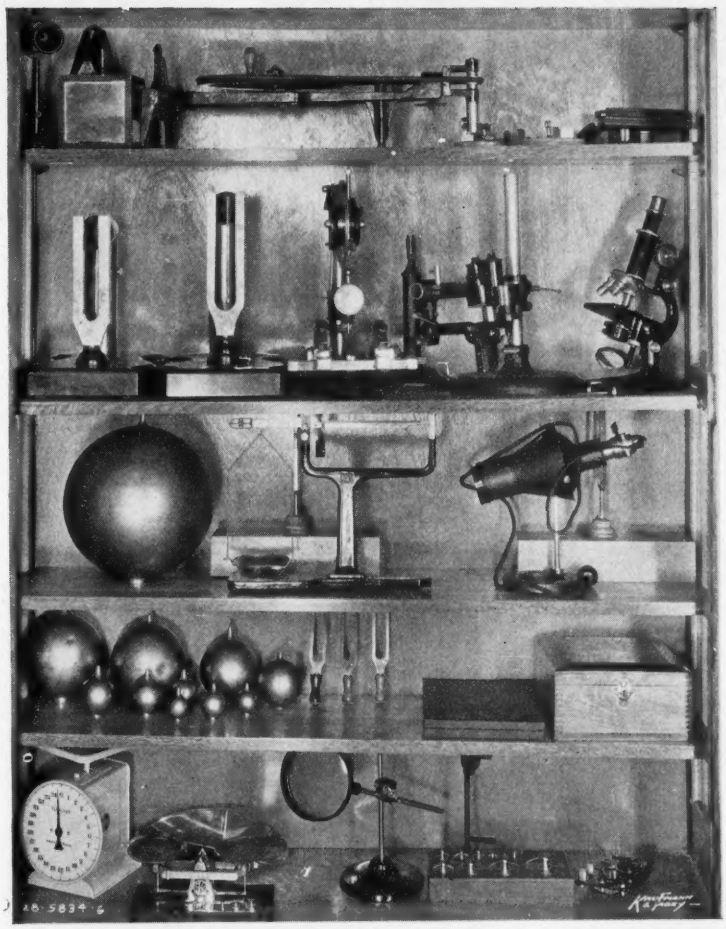
skill and enterprise of American manufacturers. The triumph of their theories over the practice of older and firmly entrenched European competitors fills a brilliant chapter in our industrial history.

It was at the instance of Jonas Chickering that the manufacture of music wire was first undertaken by the Worcester mill of the American Steel and Wire Company in 1850. This wire was used in all his instruments and proved a vital factor in the success achieved by the "Father of American pianoforte makers" and his successors. His progressiveness and indomitable energy were evidenced in numerous innovations resulting in a purity of tone and soundness of construction for which the American piano has been known ever since.

Piano Tone Revolutionized

The tonal requirements of the Jonas Chickering instrument demanded a wire of greater uniformity than was obtainable at the time, a wire less hard and more tenacious. The Worcester mill was able to meet his requirements. Later on, when the square piano was at the height of its popularity, from 1850 to 1875, changes in length, weight and tension of wires necessitated by the development of tonal resources were proportioned through the combined efforts of the Chickerings and the Worchester mill experts. By that time the Chickering had become the center of study among piano makers in this country and abroad, incorporating ideas which have been copied repeatedly from that day to this.

Meanwhile, in 1862, Helmholtz, the great German scientist, had published his monumental work on the sensations of tone. In the research that preceeded publication he used a Steinway grand piano and the principles evolved from his studies were utilized by Steinway & Sons for the further improvement of their instrument. In other words, they became tone builders.



A cabinet of acoustical and precision instruments used in testing and analyzing music wire. On the shelves are standard tuning forks, spherical resonators, vibration microscopes, and other devices employed for routine and special tests.

Without going into all the technicalities involved, one of the most important factors in the development of the improved Steinway instrument was wire, and in 1896, when all necessary plate, frame and sounding board changes had been effected in compliance with tonal requirements, the wire proposition was taken up.

Prior to this time imported wire had been used exclusively, largely because of its higher tensile strength. The impression also obtained that wire of lower tensile strength would be subject to greater elongation. a prejudice in favor of foreign labels had been augmented by a demand for volume rather than quality of tone. Strings were made with twice the tensile strength needed and, at the sacrifice of beauty of tone, many times the required hardness.

For forty years the leading American manufacturer, championing a scientific principle successfully applied in the Chickering instance, had been endeavoring to create a wider market for its softer, sweeter toned piano wire. With the acceptance of its product and principle by Steinway and other leading American piano manufacturers, a remarkable change began to take place.

World Accepts American Wire

The craze for high tension and hardness began to abate. European makers, finding their virtuosi using American pianos to a greater extent, began to lose confidence. Artists, dealers and public began to look less for volume and more for beauty of tone, and to to realize that wire suitable for the new instruments was being made at home. The

Comparison of Steel Wire Gage With the Music Wire Gage

The Music Wire Gage is the same as "American Steel & Wire Company's Music Wire Gage." Both the "Steel Wire Gage" and the "Music Wire Gage" adopted as standard for piano wire upon recommendation of United States Bureau of Standards.

No. of Gage	Steel Wire Gage	Music Wire Gage	No. of Gage	Steel Wire Gage	Music Wire Gage	No. of Gage	Steel Wire Gage	Music Wire Gage	No. of Gage	Steel Wire Gage	Music Wire Gage
6/0	.4615	.004	8	.162	.020	21	.03175	.047	34	.0104	.100
5/0	.430	.005	9	.1483	.022	22	.0286	.049	35	.0095	.106
4/0	.3938	.006	10	.135	.024	23	.0258	.051	36	.009	.112
3/0	.3625	.007	11	.1205	.026	24	.023	.055	37	.0085	.118
2/0	.331	.008	12	.1055	.029	25	.0204	.059	38	.008	.124
1/0	.3065	.009	13	.0915	.031	26	.0181	.063	39	.0075	.130
1	.283	.010	14	.080	.033	27	.0173	.067	40	.007	.138
2	.2625	.011	15	.072	.035	28	.0162	.071	41	.0066	.146
3	.2437	.012	16	.0625	.037	29	.015	.075	42	.0062	.154
4	.225	.013	17	.054	.039	30	.014	.080	43	.006	.162
5	.207	.014	18	.0475	.041	31	.0132	.085	44	.0058	.170
6	.192	.016	19	.041	.043	32	.0128	.090	45	.0055	.180
7	.177	.018	20	.0348	.045	33	.0118	.095			

triumph of the American product was publicly confirmed when, in 1900, the American Steel & Wire Company's music wire took the Grand Gold Prize at the Paris Exposition.

To maintain the supremacy thus established is the reason for being of the Chicago acoustic laboratory, under the supervision of Mr. William Braid White, who has specialized in musical acoustics for over twenty five years and who became acoustic engineer to the American Steel & Wire Company in 1927. It is not unlikely that the mechanics of the piano may be subject to further improvements in the near future, and when new wire requirements are in order they will be met half way.

Acoustic Laboratory Equipment

Part of the equipment of the laboratory is a Steinway Grand, used as a standard of tone production, and a cross-sectional model made exactly to scale in every detail from the same piano. Another interesting item is the Gaertner-White monochord, which is really nothing more less than a one-string piano. Its purpose is to enable the laboratory investigator to analyze the behavior of any piece of music wire under the conditions in which it is used in a musical instrument. One can put on a piece of wire, adjust its vibrating length as required, tune it, and then on the dynamometer read off the number of pounds of tension at which it stretched to sound that tone.

One of the most advanced devices employed for the analysis of music wire is the Westinghouse Osiso, an instrument that renders visible the music played on the piano by a combination of photographic film, vacuum tubes and electric current. The result is recorded in the form of photograph of sound waves that clearly show, not only the distinguishing outline of the waves formed by any given note struck on the keyboard, but also the personalized character given that note by the touch of the individual artist.

Two large Deagan standard tuning forks are used in the laboratory mainly to indicate time; in fact, as a sort of acoustic clock. The smaller one vibrates exactly 440 times per second when struck, and so, if its vibration is photographed, the resulting picture gives an exact check on the number of the vibrations of any more complicated sound. The number of ups and downs of the tuning-fork sound are counted in, say, one inch of film, and the other curve checked by that. The two forks are correct to within 1 vibration in 100 seconds and form, therefore, absolute standards of musical pitch. The smaller fork gives the standard "A" by which orchestras and pianos are tuned.

The round balls of assorted sizes are resonators. By placing one of them to the ear the sound to which it is tuned is reinforced so that, if it is suspected that such a sound exists as a component of a compound sound, it can sometimes be isolated in that way.

Tests Applicable to Other Wire

One of the most interesting things about what may be called the policy of anticipatory research has been found in the fact that new ways of putting it into operation are constantly being discovered. Thus, the acoustic laboratory was started for the special purpose of dealing with the problems created by music wires; yet it was hardly started before it was found that these methods of analysis, here briefly described, are applicable to other kinds and types of product. Any kind of wire which can be stretched and thrown into vibration can be analyzed by the acoustic method and already it has been possible to throw light into dark places by applying these methods on various types and kinds of spring and tempered wires. At the present time a number of problems are being investigated far removed from the musical field, which was the original cause of the establishment of the laboratory.

Much of the work of the laboratory is in the nature of individual service for musical instrument manufacturers, including problems of acoustic layouts requiring re-arrangements of length and distribution of strings and sometimes resulting in designs for wholly new frames to carry the improved stringing.

The research conducted is part of an industrial policy aimed to determine scientifically better methods of manufacture, reduce costs and improve products while maintaining contact through technical service and anticipatory research with the wants of customers.

Patent Decisions Involve Radio Tube Filaments and Wire Gauze

Inclusion of Thorium in Tungsten Wire Held to Be Old

New Wire Combination Held to Be Novel for Paper Making Machines

Westinghouse Lamp Company, Plaintiff, v. C. E. Manufacturing Company, Inc. In Equity No. 261, District Court for the District of Rhode Island.

PATENT No. 1180264, coving a thoriated tungsten filament for an incandescent lamp, was held to be of doubtful validity and not to be infringed by the radio tube employed by the defendant.

The opinion states patentee's invention resided in the use of filaments made of tungsten with the addition of small percentages of oxygen-containing thorium, the addition of this rare earth metal being for the purpose of retarding or preventing change of the filament structure to a chrystalline form, causing faulting or offsetting and burning out of the filament when subjected to the heat that is usual for incandescent lamps, and that the filaments were made from a paste forced through a die, the only method of filament making known at the time the patent issued.

Prior Use of Thoria

The prior are established beyond question that the patentee was not the first to use thoria in conjunction with other metals, including tungsten, in the manufacture of incandescent bodies, the court found, but that he was the first to point out the phenomena of offsetting, a result of a combination already present in the art. It was also stated that the patentee neither taught nor knew about the effect of thoria in a drawn wire such as employed by defendant.

Infringement, the court concluded, did not exist because the thoriated tungsten filament used in defendant's radio tube did not present a mechanical problem due to offsetting, that it was made of a drawn wire and contained a small, but scientifically exact, quantity of thorium and was operated on a current sufficient only to produce electronic emission.

Defendant's counsel contended that plaintiff had not shown good title to the patent due to a seizure of the patent by the Alien Property Custodian and conveyance by him to the chemical Foundation, Inc., and that under the trust provision of the charter of the Chemical Foundation, Inc., there was no power to convey any interest in the patent to the plaintiff, but owing

(*Please turn to page 211*)

Ex parte Albert Elsenhans. Appeal No. 994, Board of Appeals of the Patent Office.

Patent No. 1707757 was issued April 2, 1929, to Albert Elsenhans for a rotary sieve of wire gauze, particularly for paper-making machines, on application No. 110009, filed May 18, 1926.

A claim for wire gauze for paper-making machines, consisting of wires of alloy steel reinforced with weft wires of lower-quality nonrusting material, was held patentable by the Board of Appeals, the decision of the examiner being reversed.

The Board decided that appellant had done more than merely substitute alloy steel wires for the brass wires previously used, in that he obtained a structure that had marked improvements over prior-art screens in its wearing properties.

This is an appeal from a final rejection of the following claim:

"Wire gauze for paper-making machines comprising warp wires of strong, tough, nonrusting steel and weft wires of lower quality nonrusting material."

The reference cited is: Caldwell, 284,273, September 4, 1883.

Improved Steel Used

The invention relates to a wire fabric for use in paper-making machines. The specifications states that wires heretofore commonly used for the wire gauze of paper-making machines are mostly composed of bronze or material similar to bronze. It further points out that recently, since the development of highly alloyed improved steels which do not rust, it has been proposed to form the gauze out of such steels. It is stated in the brief that experiments to this end proved unsuccessful, since the tough material was not pliant enough to make a satisfactory level and even paper-machine sieve.

The instant invention is directed to the use in the wire gauze of warp wires of strong, tough, nonrusting steel and weft wires of lower quality nonrusting material. The brief presents a proposed claim in lieu of the finally rejected claim which also states that the weft wires are more easily bendable than the warp wires.

Wearing Property Improved

The patent to Caldwell discloses a wire fabric formed of brass or similar material. Additional longitudinal strength is imparted to this screen by the inclusion of an excess of warp wires. All of the wires, however, are of the same material and none of them properly may be regarded as formed of the strong, tough, nonrusting steel defined in the claim.

(*Please turn to page 210*)

Watch The Equipment and The Load

Neglect of maintenance, overloading and improper loading are common causes of crane and hoist accidents

By W. W. Peattie

Sales Manager, Northern Engineering Works, (Reprinted from "National Safety News")

ABOUT one-third of all accidents in industrial plants occur in the handling of materials. Although the majority of these occur where materials are being handled without the use of machinery, the more serious ones take place during the use of cranes, hoists, conveyors, elevators, etc.

I feel sure that nearly all accidents in connection with cranes or hoists occur with electrically operated machinery. This is not due to the lack of safety appliances or precautions in the manufacture of the machinery itself, but is due more to the fact that cranes and hoists operate at higher speeds, handle more material and are more readily overloaded. In using a chain block men in the shop are not likely to overload it, because they have to pull too hard; but they will put any load on a crane that the motor will raise.

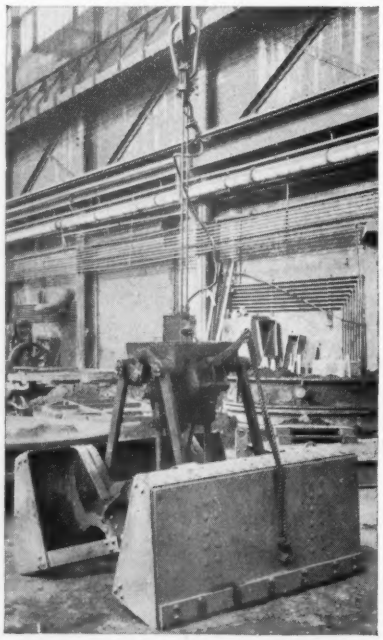
Advances in Crane Construction

In the past 20 years there has been much advancement in the design and construction of cranes from a safety standpoint as in any other piece of shop equipment. If you look at the old cranes of two decades ago and see the open gearing, open switchboards and narrow foot walks, you will appreciate this fact. Today, power driven cranes are built with all of the gearing entirely enclosed, and truck wheels are guarded so that a man going down the runway will be pushed aside by the guard without injuring him.

Guards are placed on the bridge trucks and on the trolleys to prevent dropping in case a wheel or an axle falls, and we try to limit the drop to an inch or less. A double girder construction is another recent improvement in trolleys, the purpose of this being to eliminate as far as possible the damage which may be done to a crane due to the block going up, tripping the limit stop, and the solenoid brake failing to stop the motor. Wider and more substantial footwalks are provided on most cranes, the blocks are much better guarded, and the limit stops are much more positive.

Why So Many Accidents?

With all these precautions, we are inclined to ask, why do so many accidents occur with cranes? I believe that one of the main reasons, and perhaps the most important one, is thoughtlessness on the part of the operators and on the part of the men who are hooking on the loads.



An additional cable attached to the grab bucket checks the fall in case the main supporting cable should break. This precaution has been adopted by the General Electric Company.

You will see a crane going down the runway with a load, over the heads of workmen, and the operator will be paying no attention to the fact that the men are busy and not watching where the crane is going. Often there will be no proper signal so that the men can know a load is being carried over them. You will find the operators starting the bridge and the trolley moving before the load is lifted completely, which, of course, causes the load to sway and it is very apt to swing into somebody or hit a piece of machinery. Another bad practice is throwing the controllers all the way over when starting or stopping the crane, which may cause a similar accident.

Next in the causes of accidents is neglect of the maintenance of equipment. A crane or an electrict hoist, as a rule, is up under the roof where it is dark and dirty and hard to get at, and it is very apt therefore to be neglected more than the rest of the equipment in the plant.

The Cost of Carelessness

Many accidents are caused by the brakes being out of adjustment. We often hear about a block going up into the trolley, going through the limit stop which is supposed to cut the current, and smashing in the trolley members, perhaps breaking the rods and dropping a load. The operator of that crane will probably tell you that "the limit stop did not work." But in nine cases

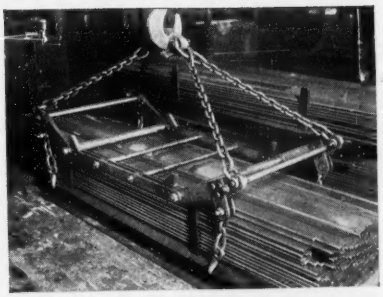
out of ten that is not the truth. What actually occurred was that the solenoid brake on the hoist motor was not adjusted, and when the limit stop cut the current the brake did not act soon enough to stop the drift of the motor.

In Chicago some time ago I called on the purchasing agent of a railroad company and found a complaint that "there was something the matter with one of our 15-ton cranes. It would lift only about two or three tons." I had one of our service men get up on the crane, and in a few minutes I heard him swearing. What actually had happened on that crane was that somebody had tightened down the shoes on the brake so that it was absolutely jammed and the motor was pulling against the whole load of the brake.

There is also the possibility that brakes are out of adjustment, and it is important to see that the gears, bearings and cables are all kept lubricated. There is not nearly enough attention given, as a rule, to lubrication of cranes. I appreciate that it is hard to get at certain parts, but this is one of the most important things in connection with maintenance, and it will increase the life of the crane considerably if proper lubrication is carried out. Cables should also be inspected frequently and if they begin to show any wear they should be replaced.

Dangerous Overloading

Equally serious as a cause of accidents is the overloading of cranes. As you know, most crane manufacturers recognize an overload of about 25 per cent at the crane rated capacity. That does not mean that the crane will not take more of a load; a large factor of safety has been provided, but gross overloading is done at the owner's risk. I realize that when an extremely heavy load is to be handled, you do not always have the proper equipment, and you choose to take a chance with the crane you have; but I believe

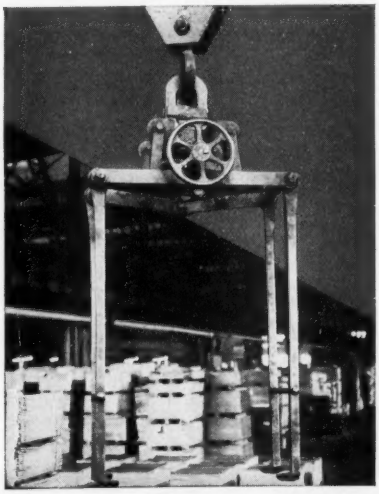


This device is used by the Ternstedt Manufacturing Company for carrying long steel bars, strips or plates. Stops are provided and the hinged points prevent the ends from swinging toward the center when the device is to be adjusted.

there are many cases where you could find safer means of handling it, and you could at least inspect the crane carefully, put on new cables and check up on the brakes. Too often even this is not done.

Short Sighted Economy

For some reason, men take a peculiar pride in seeing how much overload a crane will stand. I was in one steel mill of the Pittsburgh district recently and the foreman took me out to show me a crane that had been there for 12 or 15 years. It was a three-ton crane, and he told me how the loads they were handling had increased so that this crane was handling about 15 tons occasionally. It was a good recommendation for the crane, but some day that man will have



To prevent crane hooks slipping out of place and allowing the carrier to topple over when loaded, the Youngstown Sheet & Tube Company has filled in the hook eye with a solid plate. "Slack" is thus avoided. Rubber covered jaws prevent slipping and do not mark the tin plate.

something happen. An overload will cause fatigue in the metal of the crane, just as it will in anything else, and eventually something is bound to give way.

There seems to be a growing tendency on the part of many buyers to discount the capacity requirements of cranes and hoists. They figure that the majority of their loads will run, say, five tons, but they will have a number of loads that run ten tons; so they will take a chance on buying a five-ton crane because of the lower initial cost. There is no economy in this in the long run, because the additional wear on the parts of cranes , bearings, gears, etc., in handling these overloads will soon run up the maintenance costs to where it would have been better to have installed the heavier equipment in the first place.

The question of chain blocks and electric hoists is also of interest. There is not much chance of overloading chain blocks because they are slow moving and not subject to the hard usage which is given a crane or hoist. Design and construction of most chain blocks is much the same, and the principal attention they require is inspection of the chains, occasional changing of these, and seeing that they are properly lubricated.

The Electric Hoist Problem

Electric hoists present a different problem. The service is severe, and in the majority of plants they do not get the attention that a crane does. As a rule, anybody can come along and run an electric hoist, and if it breaks down he fixes it himself and there is not much attention paid to it. The same suggestions I have made with regard to care and inspection of cranes should apply also to electric hoists. Particular attention should be given to the limit stops and to the brakes.

Probably one of the commonest causes of accidents on electric hoists is allowing the rope

(*Please turn to page 210*)

NEWS *of the* INDUSTRY

Foreign Trade Opportunities

FOREIGN trade opportunities reported by the U. S. Bureau of Foreign and Domestic Commerce during the month of May include inquiries from the following sources: For nails, spiral or others (38238) for case making, from Otago, New Zealand; for black and galvanized iron and barbed wire (38177) from Vina del Mar, Chile; for insulated wire and cable and resistance wires (38389) from Durban, South Africa; for resistance wires for heaters (38394) from Sao Paulo, Brazil; for mild steel wire rods (38282) from Altena, Germany; for wire-fencing manufacturing machine (38286) from Sao Paulo, Brazil; for airplane bolts and shackle pins (38462) from Ottawa, Canada.

Anaconda Promotions

ANNOUNCEMENT of several promotions have been made at Anaconda Wire & Cable Company's Sycamore, Ill., plant. Thor S. Johnson, who has been superintendent of the Sycamore division and purchasing agent since the new company was formed, is now general manager of both north and south mills. Charles Townsend becomes purchasing agent and E. W. Flantsburg superintendent of both mills. I. G. Patton, formerly foreman of the braiding department, is assistant superintendent of the south mill and H. Lossman is master mechanic in charge of mechanical work of both plants.

Obituary

Calvin W. Vaughn, 70, president of the Vaughn Machinery Co., and life-long resident of Cuyahoga Falls, Ohio died suddenly of a heart attack on May 10. The machine company of which he was head is one of the oldest industrial plants in northeastern Ohio. He was born July 11, 1858. While attending high school he began working part time in the machine shops of Turner, Parks & Co., predecessor of the organization of which he became head. His early ambition was to become a machinist and follow the example of his father, the late James A. Vaughn. The younger Vaughn became an apprentice and learned the trade in his father's shop.

When James Vaughn died his son inherited his interests in the Turner, Vaughn & Taylor Co. Calvin Vaughn bought out the interests of the others and was elected vice president in 1892 and became president in 1895. The name of the corporation was since changed to Vaughn Machinery Co. In recent years the company has specialized in the manufacture of equipment for cold drawing steel wire and in the development and manufacture of continuous drawing equipment for copper wire and wire nail mill equipment.

Kennecott Buys Chase

It was announced on May 21 that the Kennecott Copper Corp. has virtually completed negotiations for the acquisition of the Chase Cos., Inc., largest independent manufacturer of brass and copper products in the country, with main offices in Waterbury, Conn., and factories in Waterville, Conn. The acquisition of the Chase group of companies will mark the initial step of the Kennecott Copper Corp. into the manufacturing end of the copper industry. Heretofore, Kennecott, which is the largest single producer of copper metal in the world at which is conceded to be the lowest cost, has confined its operation to the producing field alone.

Building and Expansion

THE Seneca Wire & Mfg. Co., has completed arrangements for taking over the plant of The Wheeldon Wire company, located in West Brookfield, Mass. This plant manufactures a complete line of iron and steel wire and has been in operation for the past five years. It is the intention of the Seneca Wire & Mfg. Co. to continue to operate this newly acquired plant at its original location at West Brookfield, Mass. The Seneca Wire company, about a year ago, took over a wire screen cloth manufacturing plant located at Hanover, Pa., which is being operated at its original location as the Wire Cloth Division of the Seneca Wire company.

THE Nachman Spring-Filled Corp. of Chicago, world's largest manufacturer of spring units for mattresses, automobile cushions and furniture, has completed negotiations for the establishment of a big plant in Norfolk, Va. Operations are scheduled to begin this month.

Charles R. Simmons, secretary and treasurer of the Nachman corporation, said that if Norfolk facilities and conditions work out as anticipated his company will take steps within the next few months to erect a modern, multi-storied daylight plant containing from four to five acres of floor space and involving an investment of approximately $500,000.

National-Harris Wire Company, 195 Verona Ave., Newark, N. J., has recently purchased the plant and equipment of the Connecticut Wire Company, Waterbury, Conn., and has begun moving this establishment's equipment in its entirety from Waterbury to Newark. Additional buildings have been taken over at the Verona

Avenue address to accommodate the equipment. The National-Harris Company has recently added to its list of manufactured products filament ribbon and seamless nickel tubing for radio tube manufacturers.

Gilby Wire Co., 150 Riverside Avenue, Newark, N. J., plans rapid expansion beginning with the addition of 16,000 square feet of floor space. A technical division has been added to the personnel in charge of A. J. Marino, chemical engineer, formerly with General Electric Company, and S. R. Keith, metallurgical engineer, formerly with Bethlehem steel Co. Wilbur B. Driver, president of the company, recently left for Europe on a combined business and pleasure trip in the course of which he will visit the Barcelona Exposition and several of the company's European representatives.

The Chicago Steel and Wire Company, manufacturers of book binders, stitching wire and stapling wire, and its associate, Fusion Welding Corporation, both of 103rd Street and Torrence Avenue, Chicago, an nounce plans for the construction of new general offices adding over 8,000 square feet to the space they now occupy. The growth of the business of the company has made necessary this additional space.

A new organization styled Vitalite Co. has been organized by officials of New York Wire Cloth Co. and the Celluloid Corporation of Newark, N. J. to manufacture wire cloth of fine mesh coated with a special composition to form a flexible wire glass.

Wiremold Co., 410 Asylum Street, Hartford, Conn., manufacturer of electric wiring devices, will build and equip a new plant in the Elmwood section at an estimated cost of about $50,000.

Newark Metal Screen Co., Newark, N. J., has been incorporated and capitalized at $200,000 to manufacture a new patented window screen. Charles O. Frye is treasurer and general manager at 161 Ogden Street.

Beaver Mfg. Co., 625 North Third Street, Newark, N. J., manufacturers of electric wiring equipment and devices, has awarded contract for an addition to be built and equipped at a cost of about $45,000.

COMING EVENTS

June 3-6. National Assn. of Purchasing Agents at Buffalo. Secretary, George A. Renard, 11 Park Place, New York.

June 5-7. Canadian Electric Railway Assn. at Montreal. Secretary, E. Smith, Jr., 35 Yonge St., Toronto.

June 17-22. Twenty-fifth Annual Iron and Steel Exposition. William Penn Hotel, Pittsburgh, Pa.

June 24-28. Summer Convention, American Institute of Electrical Engineers, Swampscott, Mass. F. L. Hutchinson, Secretary, 33 W. 39th St., New York City.

June 24-28. Annual meeting, American Society for Testing Materials, Chalfonte Haddon Hall Hotel, Atlantic City, N. J. C. L. Warwick, Secretary, 1315 Spruce St., Philadelphia.

July 1-4. Summer meeting American Society of Mechanical Engineers at Salt Lake City, Utah. Calvin W. Rice, Secretary, 29 W. 39th St., New York City.

July 8-11. Annual Convention, American Electro Platers' Society, at Detroit, Mich.

September 9-13. Annual convention of the American Society for Steel Treating at Cleveland, Ohio. W. H. Eisenman, secretary, 7016 Euclid Ave., Cleveland, Ohio.

September 9-13. Eleventh National Metal Exposition under the auspices of the American Society for Steel Treating at the Cleveland Public Auditorium, Cleveland, Ohio. W. H. Eisenman, secretary, 7016 Euclid Ave., Cleveland.

October 15-17. Bridge and Building Supply Men's Assn. at New Orleans. Secretary, I. B. Tanner, 332 S. Michigan Ave., Chicago, Ill.

October 29. World Engineering Congress, Tokio, Japan. George W. Fuller, Chairman American committee on attendance, 170 Broadway, New York City.

December 2-7. National Exposition of Power and Mechanical Engineering at New York. Address Charles F. Roth, 420 Lexington Ave., New York City.

December 18. International Assn. Municipal Electricians at Boston. Secretary, H. N. Lang, City Hall, Orlando, Fla.

Worcester Wire Works, 230 Ludlow Street, Worcester, Mass., has broken ground for a two-story factory addition to its present plant.

Enterprise Wire & Iron Works, Inc., 423 N. High Street, Baltimore, will build and equip a factory addition at an estimated cost of $35,000.

Dudlo Mfg. Co. division of General Cable Corporation, Fort Wayne, Ind., has let contract for a one-story addition to be built and equipped at an estimated cost of $100,000.

American Enameled Wire Co., Muskegon, Michigan, subsidiary of Electric Auto-Lite Co., Toledo, Ohio, is planning new building and equipment to the extent of about $100,000.

Chicago Steel & Wire Co., 10257 Torrence Ave., Chicago, will build an addition at an estimated cost of $10,000.

Broderick & Bascom Rope Co., 801 North Main Street, St. Louis, Mo., manufacturers of wire rope, will build and equip a factory addition at an estimated cost of $125,000.

Central Steel & Wire Co., West Monument Avenue, Dayton, Ohio, is planning to build and equip additional factory units at an estimated cost of $80,000.

The Bear Steel & Wire Co., 9 Clinton Street, Chicago, has bought the plant and equipment of the Falcon Tin Plate Co., Canton, Ohio. The plant was recently bought by the Kulka Iron & Metal Co., Alliance, Ohio, which resold it to the Bear company.

De Mattia Wire Works, Inc., Southport, Conn., manufacturers of wire cloth, coal screens, wire mesh baskets, etc., has changed the firm name to Rolock, Incorporated. There is no change in management or business policies.

Sleeper & Hartley
TRADE MARK
REG. U.S. PAT. OFF. & PRINCIPAL FOREIGN COUNTRIES

Practical Wire Wo

These Machines Go Into Production at ce—

Continuous Rod Frame

(No. 5—14 or 15 wire)

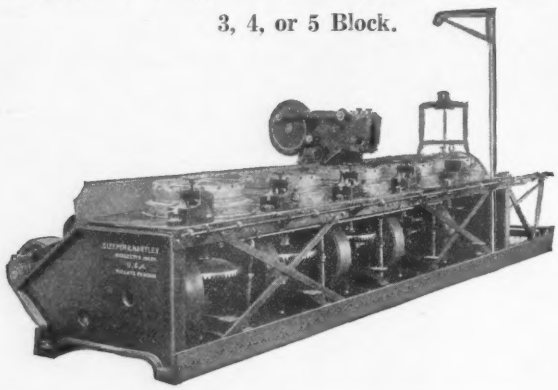
Patented June 3, 1924—May 12, 1925—others pending

All Ball or Roller Bearings

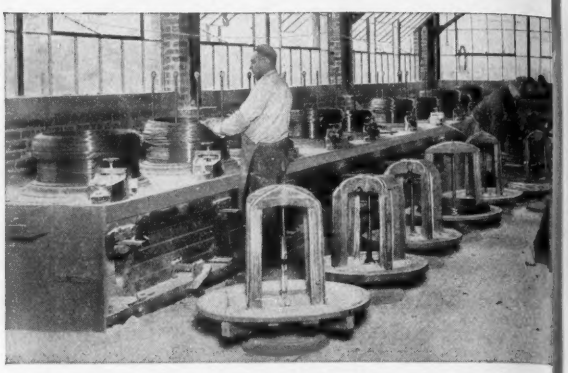
No Differential Gearing.

Automatic Compensation for Speeds of Heads.

3, 4, or 5 Block.



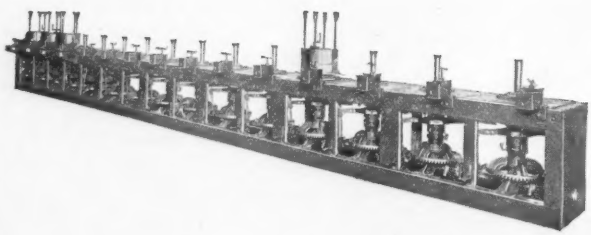
Single Hole Drawing



Standard Rod Frame—10 Block

Long, Stiff Spindles, in anti-friction bearings, and equipped with friction Clutches. Powerful and reliable. Practically noiseless in operation.

(New Plant of Thompson Wire Co., Worcester, Mass.)



Heavy 16" Frame For .65 Carbon Wire No. 10½ to .037"

15 Blocks: Motor driven. Silent chain. Anti friction bearings and cut gears throughout.

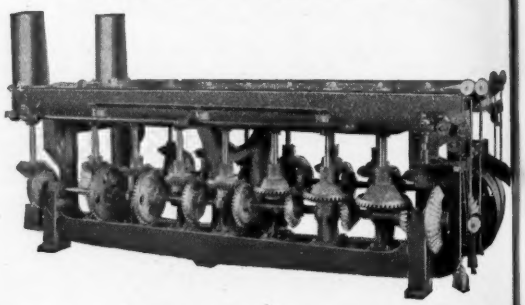
(New Plant of Johnson Steel & Wire Co., Worcester, Mass.)

Double 8-Draft Fine Wire: We

No. 22 to 36. High or low carbon wire.

6 Blocks to Average Operator, 22-33, 8-hole, 660 lbs. p ay of ten hours.

Many thousands of these heads in operation



CHICAGO TERRITORY
Neff, Kohlbusch & Bissell, Inc.

SAN FRANCISCO AND LOS ANGELES
L. G. Henes Machinery Company

FOREIGN AGENTS AND REPRESENTATIVES: UNITED KINGDOM—Mr. Fredk. A. Perry, 63 Queen Victoria St., London, E. C. 4.

SLEEPER & H

Working Machinery

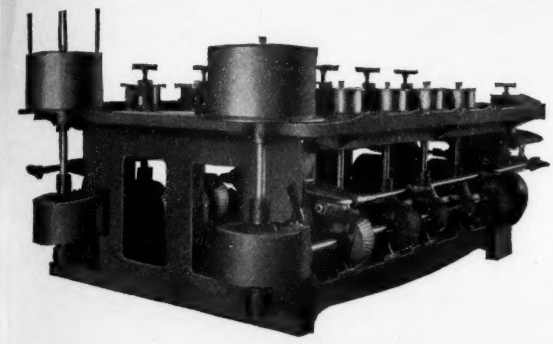
Sleeper & Hartley TRADE MARK

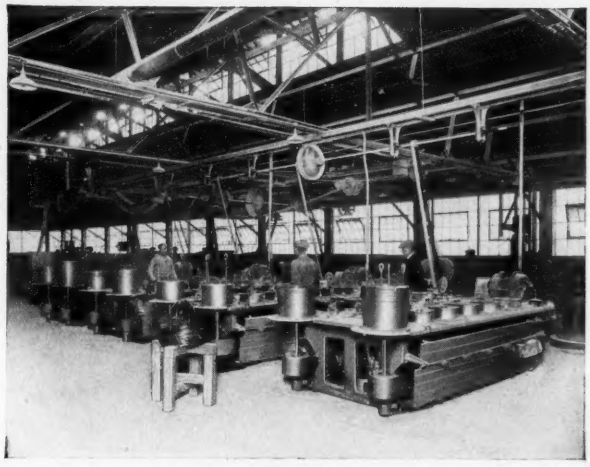
at once—Reducing Overhead—Increasing Production!!

Double 5-Draft Dry, Intermediate

No. 14 to No. 23. High or low carbon wire.
3 to 4 Blocks to Average Operator.
No. 14 to 19—4 hole, 1400 lbs. per block.
No. 14 to 20—5 hole, 1100 lbs. per block.

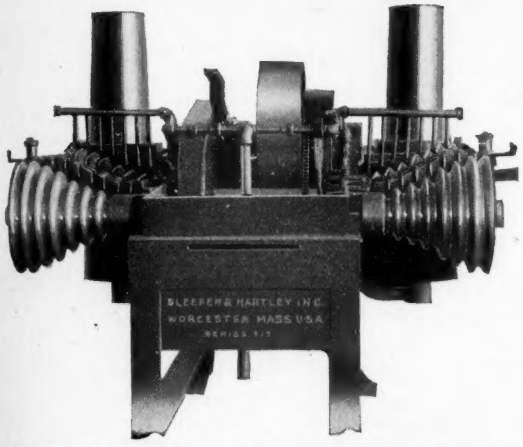
More than 300 heads of this improved model in operation



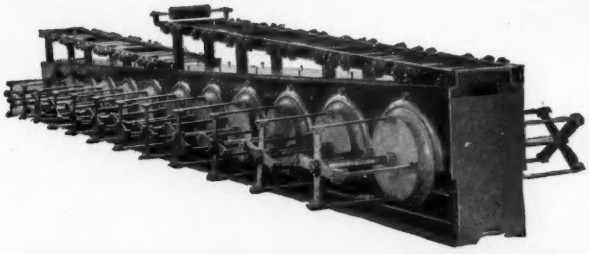


Battery of Double Six-Draft Dry Continuous For High Carbon Wire

Direct driven with silent chain. Cut gears throughout. Anti-friction bearings. Variable speed for finishing block.
(New Plant of Thompson Wire Co., Worcester, Mass.)



Improved Double 8-Draft Cone Type Continuous Wet Wire Drawing Machine



Patenting Furnace Take-Up

(New Plant of Thompson Wire Co., Worcester, Mass.)

Philadelphia Territory
Swind Machinery Co.

NEW YORK—Triplex Mch. Tool Co. AUSTRALIA AND NEW ZEALAND—Edwin Wood Pty., Ltd., Melbourne.
JAPAN—Andrews & George Co., Tokyo. MONTREAL AND TORONTO—Arthur Jackson Mch. Tool Co.

HARTLEY, Inc., WORCESTER, MASS., U. S. A.

Wire Plants Report Annual Industrial Accident Statistics

Accident Record of Individual Wire Working Plants, 1928

Rank	Average Number of Employees	Total Hours Worked	Number of Lost Time Accidents — Disability — Death	Permanent	Temporary	Total	Number of Days Lost — Disability — Death	Permanent	Temporary	Total	Rates 1928 — Frequency	1928 — Severity	1927 — Frequency	1927 — Severity
Total	**16,044**	**40,844,603**	**3**	**39**	**895**	**937**	**18,000**	**26,069**	**14,296**	**58,365**	**22.94**	**1.43**	**15.99**	**1.28**
1	55	129,440	.....	.....	.....	.....	.....	.....	.....	.....	0	0	19.54	.27
2	26	62,907	.....	.....	.....	.....	.....	.....	.....	.....	0	0	13.17	.14
3	95	278,570	.....	.....	1	1	.....	.....	12	12	3.59	.04	16.85	.04
4	755	1,817,239	.....	2	10	12	.....	600	206	806	6.60	.44	9.66	.42
5	2,607	6,170,614	.....	6	37	43	.....	1,050	1,181	2,231	6.96	.36	5.46	3.06
6	117	244,296	.....	.....	2	2	.....	.....	11	11	8.19	.05	20.56	.27
7	303	793,927	.....	2	5	7	.....	3,600	178	3,778	8.82	4.76	2.86	.05
8	346	1,008,845	.....	2	7	9	.....	600	21	621	8.92	.62	12.70	1.33
9	2,158	5,740,957	.....	9	52	61	.....	4,580	1,615	6,195	10.63	1.08	6.96	1.87
10	155	409,200	.....	.....	5	5	.....	.....	21	21	12.22	.05	21.46	.24
11	654	1,637,620	.....	1	20	21	.....	1,800	461	2,261	12.82	1.38	16.61	1.53
12	142	298,859	.....	.....	4	4	.....	.....	99	99	13.38	.33	28.64	.66
13	33	74,250	.....	.....	1	1	.....	.....	8	8	13.47	.11	.....	.....
14	958	2,497,855	.....	7	31	38	.....	189	366	555	15.21	.22	20.36	.18
15	709	1,462,234	.....	1	22	23	.....	300	496	796	15.73	.54	16.88	1.44
16	639	1,826,968	.....	.....	34	34	.....	.....	200	200	18.61	.11	6.41	.05
17	802	2,001,792	.....	.....	38	38	.....	.....	223	223	18.98	.11	15.37	.17
18	750	1,671,621	.....	.....	33	33	.....	.....	238	238	19.74	.14	21.59	3.97
19	337	903,160	1	.....	26	27	6,000	.....	1,314	7,314	29.89	8.09	16.20	5.55
20	45	102,000	.....	.....	4	4	.....	.....	26	26	39.22	.26	10.50	.20
21	173	419,193	.....	.....	17	17	.....	.....	244	244	40.55	.58	23.05	.33
22	343	935,094	1	.....	38	39	6,000	.....	777	6,777	41.71	7.25	.....	.....
23	133	255,480	.....	.....	11	11	.....	.....	61	61	43.06	.24	45.07	.07
24	1,268	3,316,082	.....	1	143	144	.....	300	1,338	1,638	43.43	.49	32.05	.89
25	400	920,588	.....	2	38	40	.....	6,450	842	7,292	43.45	7.92	.....	.....
26	289	737,304	1	2	30	33	6,000	600	257	6,857	44.76	9.30	20.72	.13
27	141	351,286	.....	.....	16	16	.....	.....	176	176	45.55	.50	25.29	.23
28	189	455,842	.....	.....	21	21	.....	.....	205	205	46.07	.45	50.71	.65
29	237	712,380	.....	1	35	36	.....	1,800	405	2,205	50.53	3.10	.....	.....
30	1,035	3,219,000	.....	3	190	193	.....	4,200	3,280	7,480	59.95	2.32	.....	.....
31	150	390,000	.....	.....	24	24	.....	.....	35	35	61.54	.09	.....	.....

Note that the first 2 establishments listed above have equally perfect no-accident records in 1928.

Manufacturers of Wire Products

	4,477	**11,625,849**	**1**	**8**	**372**	**381**	**6,000**	**6,300**	**4,390**	**16,690**	**32.77**	**1.44**	**29.22**	**.65**
1	272	621,203	.....	.....	2	2	.....	.....	68	68	3.22	.11	0	0
2	1,758	4,629,279	.....	2	53	55	.....	1,200	1,001	2,201	11.88	.48	16.05	.64
3	27	68,108	.....	.....	1	1	.....	.....	5	5	14.68	.07	38.92	.17
4	112	289,647	.....	.....	6	6	.....	.....	70	70	20.71	.24	5.79	.03
5	82	209,200	.....	.....	6	6	.....	.....	63	63	28.68	.30	21.57	.22
6	112	304,589	.....	1	11	12	.....	300	69	369	39.40	1.21	61.02	.50
7	355	934,798	.....	2	35	37	.....	600	445	1,045	39.58	1.12	49.85	3.45
8	486	1,123,130	.....	1	61	62	.....	1,800	792	2,592	55.20	2.31	.....	.....
9	1,125	3,087,558	1	2	172	175	6,000	2,400	1,669	10.069	56.68	3.26	58.92	.85
10	148	358,337	.....	.....	25	25	.....	.....	208	208	69.77	.58	208.70	.64

THE progress of the Metals section in accident prevention in 1927 was continued in 1928. Accident rates for the entire section indicated a reduction of ten per cent in frequency and nine per cent in severity. Rates of 160 identical establishments, those reporting in each of the two previous years, also continued the downward tendency exhibited in 1927. This group has accomplished a total reduction of 25 per cent in the frequency rate and 27 per cent in severity rate since 1926.

Wire Manufacturing Plants had a slightly less favorable experience. The 1928 accident rates for three-year identical plants were higher than those of 1927, but the frequency rate was 47 per cent and the severity rate 32 per cent lower than the corresponding rates for the 1926 period. Each establishment is given a key number, known only to the National Safety Council and officials of the reporting establishment, and all published records of that firm can be identified only by the key number. The report submitted by each establishment is designed to provide only two points of information—the accident frequency rate, and the accident severity rate. The first of these is defined as the number of lost time personal injuries per one million hours exposure; the second is defined as the number of days lost from accidents (including arbitrary figures for permanent disabilities) per 1,000 hours exposure.

It needs also to be emphasized that officials of an individual establishment, if they expect to prevent accidents, must not be satisfied with keeping only those statistical records that permit the computation of accident frequency and severity rates. Success in accident prevention work necessitates a study of fundamental causes of accidents, classification by departments and locations, and other detailed analyses. Accident frequency and severity rates indicate the importance of the problem and success or failure in solving it; other records must point the way to specific safety activities.

DIGEST *of* RECENT TRADE LITERATURE

Recent Developments in Electric Furnaces. Paper presented at March, 1929, meeting of the Institution of Mechanical Engineers. The Institute of Metals, 36 Victoria St., S. W.. 1., London, England.

The paper, by D. F. Campbell, M. A., A. R. S. M., consulting engineer, describes the improvements and modifications in melting practice during the last two years and discusses the relative performance of small and large induction furnaces and the reasons for selecting the size of the unit according to the work to be done. A short description of improvements in practice with high-frequency furnaces and details of new methods of lining these furnoces are given. A general survey of heat-treatment furnaces follows, with a detailed description of a number of specific ones. The largest brass works, where electricity is utilized more than elsewhere, is described with explanation of the uses to which electricity has been applied; with diagrams showing the energy consumed and the effect of the special precautions used to improve power and load factor.

Effect of Inhibitors on the Acid Solution of Copper and Copper Alloys. Industrial & Engineering Chemistry, December, 1928. P. 1369.

Reporting data from experiments conducted in the Department of Chemical Engineering, Massachussetts Institute of Technology. The addition of inhibitor material greatly diminishes the corrosion of copper and copper alloys in concentrated hydrochloric acid. In more dilute acids the effect of inhibitors is not so marked. In acid ranges in which inhibitors are effective, hydrogen evolution is quite rapid even in the case of copper. These effects support the belief that the mechanism of the protective action of inhibitor materials is the deposition of an absorbed layer of inhibitor or substance formed from the inhibitor which decreases the area effective for depolarization.

Magnetic Analysis. Journal American Institute of Electrical Engineers, January, 1929. P. 7.

Raymond L. Sanford, Chief of the Magnetic Section, U. S. Bureau of Standards, presents a brief outline of the development and application of magnetic analysis for the nondestructive testing of iron and steel and their products. The subject is treated under the headings: historical development; experimental results; and practical commercial applications. In commercial routine inspection to which magnetic analysis has been applied, the author mentions only the inspection of small case hardened chain, small heat-treated forgings, and the examination of steam turbine bucket wheels. He predicts rapid future progress for the method.

Why We Dropped 57½ Per Cent of Our Customers. Printers' Ink, April 4, 1929. P. 17.

The Champion Manufacturing Company, makers of wood screws, machine screws and stove bolts, decided that its unprofitable customers were not worth encouraging and as a result dropped over half of them. The decision to do so followed analysis which disclosed that 97.3 per cent. of the total sales volume was being drawn from 42½ per cent. of the customers. Or, as George J. Dunbaugh, Jr., General Sales Manager of the Company, puts it in other words, more than 90 per cent. of the sales effort was being invested in a field that yielded less than 10 per cent. of the total sales. The article tells in detail why this radical policy was adopted and what the results have been after several months' trial.

Trade Literature Received

Aircraft Products Directory

"Buyers' Guide of Aircraft Products." Motor & Equipment Association, 250 W. 57th St., New York City. 56 pages. Paper. Lists of names and addresses of manufacturers and distributors of products used in aircraft production and maintenance, parts, accessories, supplies, production and service equipment, airport and lighting equipment, with a geographical listing of main headquarters and branches of wholesals supply houses in the United States and Canada.

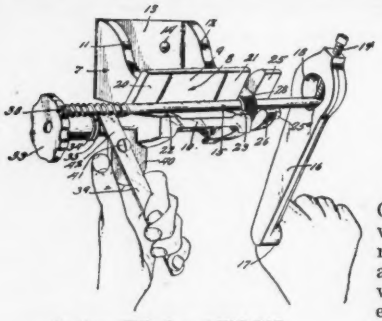
Welding Practice

"Economy in Arc Welding Practice". Four Bulletins. The Wilson Welder and Metals Co., Wilson Bldg., Hoboken, N. J. The separate titles in the series are: "The Welding Cables", "A Brief History of Electric Arc Welding", "Process of Welding Copper, Brass, Monel, Bronze, Nickel, Aluminum and Machinable Cast Iron Welds", "Economy Effected by Arc Welding Practice", and "Good Welding Essentials".

Industrial Safety Work

"Directing the Plant Safety Work." Policyholders Service Bureau, Metropolitan Life Insurance Company, New York City. 24 pages. This pocket size booklet is one of a series presenting the basic principles of successful industrial safety work. It is addressed primarily to the chief operating official and deals with the need for competent direction of safety activities in both large and small organizations and outlines the qualifications, duties and functions of the safety director.

A REVIEW *of* RECENT PATENTS



Spring Winder 1,709,707

No. 1,709,707, SPRING WINDER AND THE LIKE. Patented April 16, 1929, by Herbert J. Bragdon, of Chicago, Illinois, Assignor to Chester A. Turbin, of Madison, Wisconsin. Various sized wire springs may be wound by this machine by changing the size of the arbors, which are readily interchangeable. A novel tensioning device for regulating the amount of tension exerted on the wire as the wire is drawn up onto the arbor, is included.

No. 1,711,277, WIRE CUTTING MACHINE, Patented April 30, 1929 by George F. Matteson, of Rockyhill, Connecticut, Assignor to The F. B. Shuster Company, of New Haven, Connecticut. The patentee provides especially for a mechanism for receiving the several lengths of wire from the wire cutting machine, and for discharging the several lengths. This mechanism includes a box in the form of a bar, with a groove in its under surface and, a wire rest movably mounted to close the open side of the groove in the box.

No. 1,707,567, WIRE FABRIC. Patented April 2, 1929, by Edward F. Pink, of Cambridge, Maryland. This invention relates to a woven wire fabric especially adapted for use for belts or the like, the general object of the invention being to form the fabric of helical wire members extending crosswise of the belt, with the belt composed of sections, the helical members of one section being reversely arranged to those of the other section so that the tendency of the belt to creep sidewise on the drums or pulleys is counteracted and also to so connect the sections together that the helical members of one section are in alinement with those of the other section so that an endless belt can be formed of the fabric.

No. 1,707,757, ROTARY MACHINE SIEVE OF WIRE GAUZE PARTICULARLY FOR PAPER MACHINES. Patented April 2, 1929, by Albert Elsenhans, of Essen, Germany. The inventor provides warp wires of strong, tough, non-rusting steel, as for example highly alloyed chromium nickel steel and weft wires of lower quality more easily bendable, non-rusting material (as bronze wire), since the weft wires are subjected to less strain.

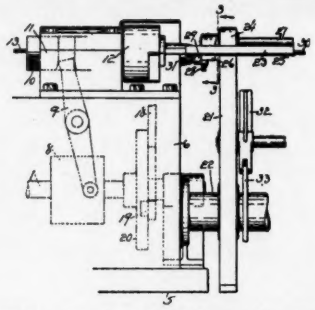
Complete descriptions and drawings of any of the patents referred to on this page may be had for twenty five cents. Address orders to Wire & Wire Products, 551 Fifth Avenue, New York City.

No. 1,708,314, WIRE STITCHING MACHINE. Patented April 9, 1929, by Ernest Leschhorn, of Chicago, Illinois, Assignor to Latham Machinery Company, a Corporation of Illinois. More particularly, this invention relates to the feeding and cutting mechanism of a wire stitching machine, means being provided to adjust this mechanism so that it will stitch various sized wire staples. The knife is always actuated through the same cutting movement by the actuating mechanism regardless of its position of adjustment.

No. 1,708,585, CUTTING DEVICE FOR WIRE CLOTH. Patented April 9, 1929, by Charles M. McCarthy, of Minneapolis, Minnesota. Wire screen and cloth is now sold in many retail stores and is kept in stock in rolls. It is necessary to have a large number of rolls of various sizes and it has generally been an inconvenient procedure to dispense this material. Applicant has invented a rack on which the rolls of material may be carried. The wire cloth is drawn over a stationary cutting device, having a movable cutter, which can be moved to sever the wire cloth.

No. 1,710,384, REEL. Patented April 23, 1929, by William H. Sommer of Peoria, Illinois. This invention has reference to reels and relates particularly to that type of reel on which is wound barb-wire, altho it is useful for holding plain wire, or like material. The reel is constructed entirely of wire, including end members, tie-rods and while this construction is not new, the patentee having been granted U. S. Patent No. 1,510,750, on October 7, 1924, for such a construction, but in the present invention he improved on the prior invention in the use of a different method of welding the ends and intersections of the wires.

No. 1,710,699, WIRE FABRIC AND METHOD OF MAKING THE SAME. Patented April 23, 1929, by John P. Weis, of Nyack, New York,



Wire Cutting Machine 1,711,277

Assignor to Metropolitan Sewing Machine Corporation of Nyack, New York. This wire fabric is formed of metal wire and has a mesh adapted for use for screening purposes and provided along the parallel side edges thereof with sewing machine stitches of relatively soft, compressible material forming friction-gripped, cushioned edges adapting the fabric to be effectively gripped and clamped along such edges.

No. 1,708,165, COILING DEVICE. Patented April 9, 1929, by Arnold F. Willat, of San Rafael, California. This device is intended for use in preventing the cords of telephones, electric irons, etc., from becoming knotted and twisted and comprises a single piece of resilient wire bent to form a series of spaced annular clips open on one side and joined to one another by straight wire portions which extend at right angles to the clips and are in staggered relation to one another, which wire being thus bent is convolved to form a retractile spring with the clips disposed at spaced intervals on convolutions of the spring.

No. 1,709,015, WIRE SPLICING PROCESS AND APPARATUS. Patented April 16, 1929, by Harley H. Heller, of Riverside, Connecticut, and Erick G. Colson, of Richmond Hill, New York, Assignors to Ford Instrument Company, Inc., of Long Island City, New York. The apparatus includes coacting jaws which grip the two or more terminals of wire along the length which is to be spliced, and twist them together by a combined simultaneous rotary and retracting motion in such a manner that the wires, while being twisted together, are gradually emerging from between the jaws, at the edges of which the twisting action takes place. When the twisting operation is completed, the twisted splice extends between the coil face and the edges of the twisting jaws, the end of the splice remaining gripped between the jaws, and consequently leaves an extremely short untwisted length of each wire which may be left as they are cut off, as desired.

Domestic Exports and Imports of Iron and Steel Wire and Wire Products

Exports of iron and steel wire and wire products from the United States in February and March, 1929
(In gross tons)

Item	March, 1929	February, 1929	March, 1928	January through March	
				1929	1928
Wire rods	5,341	3,539	2,134	12,538	7,449
Plain wire		5,498	5,072	14,684	12,044
Barbed wire and woven wire fencing	6,576	5,642	7,076	18,747	17,030
Wire cloth and screening	151	201	178	504	477
Wire rope	749	724	442	2,093	1,479
Insulated wire and cable	157	66	60	386	147
Other wire and manufacturers of	1,003	1,099	987	3,028	2,348
Wire nails	2,051	1,589	1,175	5,138	3,687
Nails other than wire	1,080	671	838	2,587	2,122
Tacks	72	44	90	174	227

Imports

Imports of iron and steel wire and wire products into the United States
(In gross tons)

Item	March, 1929	February, 1929	March, 1928	January through March	
				1929	1928
Wire rods	1,365	595	2,135	3,143	5,399
Barbed wire	617	349	400	1,251	986
Round iron and steel wire	584	540	386	1,726	971
Steel telegraph and telephone wire	.....	.....	.....	.....	36
Flat wire and strip steel	119	167	240	435	588
Wire rope and strand	323	153	138	609	406
Other wire	61	38	94	140	188
Nails, tacks, and staples	547	558	709	1,813	1,646

The following figures show exports of electrical equipment from the United States for March, 1928 and 1929, and for the first three months of 1928 and 1929.

Preliminary figures for United States electrical wire and wire product exports
(In dollars)

Article	March		3 months ended Mar. 31	
	1928	1929	1928	1929
Insulated wire and cable, iron or steel	$22,847	$43,740	$61,608	$138,865
Copper, bare wire	159,610	406,646	541,656	988,845
Copper, insulated wire and cable	432,989	692,085	1,125,081	1,916,604
Insulating material	119,034	159,210	337,906	381,402
Other wiring supplies and line material	90,057	124,365	249,083	335,954

The March trade in iron and steel wood screws continued the decrease shown in the February trade, declining from 793,671 gross valued at $81,033 to 540,650 gross valued at $59,588 in March. On the other hand, shipments of brass wood screws showed a gain, totaling 60,670 gross valued at $16,703 in March, as against the February shipments of 58,465 gross valued at $15,758.

Exports of insulated copper wire and cable during March amounted to $692,085, an increase of $259,096. Italy and Canada each imported approximately $95,000 worth of this commodity. South and Central American countries were good markets and exports to the Philippine Islands amounted to $56,695. The United Kingdom purchased such material valued at $47,753.

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Screw Eye Machines
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Riveting Machines
Wire Pointers
Wire Rolling Mills
Headers of all kinds
Bolt & Nut Machines
Tapping Machines
Cotter Pin Machines
Wire Nail Machines
Spring Machines
Chain Machines
Rivet Machines
Cut Nail Machines
Draw Benches
Bull Blocks
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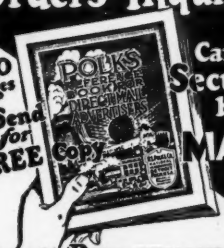

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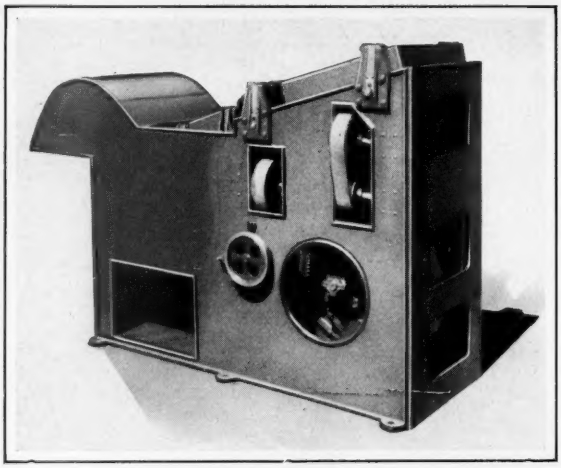
New Chip Separator



THE McKenzie Engineering Company, New Rochelle, N. Y., manufacturers of various types of special machinery, have placed on the market a machine for separating screw machine products from the chips formed in the operation of the screw machines. The equipment, shown in the illustration, is capable of separating out a bushel of ordinary screw machine products in one minute. The machine will handle parts ranging from ⅛ inch to 2½ inches in diameter, and up to 4½ inches long, including all descriptions of screws, bolts, nuts, wood screws, cartridge shells, etc. The latest model is heavier, lower and with more solid frame than the older types, and has blast gate combined with blower. The vibrator and self feeder are hung on swing brackets and driven with crank shafts. The machines are equipped either with motors or with countershafts, according to user's needs.

The machine is used after oil has been extracted from the mass of chips and products taken from the screw machine. The whole mass is thrown into the separator, an air blast is adjusted to blow according to size of product, and this feeds the material into a vibrator, where separation occurs, after which the products are removed. The makers claim one separator will take care of the output of 400 to 500 automatic screw machines. The dimensions are 5½'x40"x 21". Weight, with 3 H. P. motor, crated, 1620 pounds.

New Welded Steel Wire Reel

A NEW form of wire reel, or swift, especially adapted for use with cable or wire rope stranding machines has been developed by the Pittsburgh Producers Supply Co., 115-17 Metropolitan St., Pittsburgh, Pa. The reel is 36 in. in diameter overall and about 24 in. high. It has a capacity of 300 lb. and a rated speed of 800 r.p.m. The jaws are adjustable to take coils from 12 to 30 in. inside diameter.

The whole reel is made up of steel sections cut to form and welded together, making an assembly considerably lighter and simpler than usual. The rim is formed of a 2 by ¼-in. section rolled to shape and butt welded. The hub consists of a plate 4 in. in diameter and ½ in. thick, to the circumference of which is welded a collar of seamless tubing 2 in. high. This collar provides an abutment for the T-sections making up the reel spider.

These sections, made of ¼-in. stock, are butt welded to the rim and the hub collar. They support the reel dogs, which are made of U-sections formed at

the bottom to fit over the upper part of the T-section of the spider. They are bolted to the face plate, and the whole is adjustable by means of a dog which fits in holes drilled in the T-section. The face plates are removable.

The standard is made from a piece of extra heavy 3-in. seamless tubing, welded to a heavy 20 x 20-in. flat plate, with bolt-holes at the corners for mounting. The center shaft, of 1½-in. steel, is mounted in two Timken bearings, which support the whole load of the reel and spider, and serving as guide bearings for the shaft. A simple form of brake rigging is used, being a U-section bolted to two studs which are welded to the base.

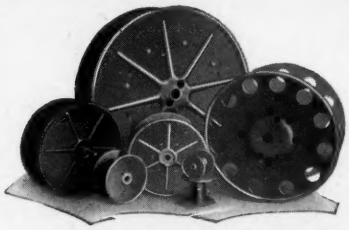
New Graph Paper

A new cross-sectional paper with effaceable rulings for engineers and draftsmen is now being supplied by the United States office of Carl Schleicher & Schull Co., 17 Madison Avenue, New York. Drawings can be made on this paper with India ink or pencil and the pencil marks can be erased without affecting the rulings. After completion of the drawing the sectional lines can be easily washed off by using a sponge and clean water, whereupon the pencil lines will completely disappear. The drawing paper used as the base of this new kind of sectional paper is said to satisfy all requirements in regard to resistance to erasure and after cross-sectional lines have been removed by washing, it permits of the application of additional ink and water colors without danger of running.

A New Brinell Microscope

THE ever increasing use of the Brinell-Hardness test in industry has made is necessary to perfect the existing lens and measuring microscope devices, which are essentially adapted to laboratory use; or even to replace them by another instrument, which would afford abso-

(*Please turn to page 207*)



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Light Enough for Easy Handling

Apco Mossberg reels combine extreme light weight with extra strength and long wear. They are made of pressed steel, scientifically braced and reinforced to give great strength without great weight.

They are cutting costs in many operations of wire working, handling and shipping.

Let us work out the sizes and types of reel, spool or bobbin that will fit in with your needs.

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Specialists in development of steel reels for annealing, vulcanizing and stranding; also bobbins for wire weaving.

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Accurate

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Our experts will solve your die problems

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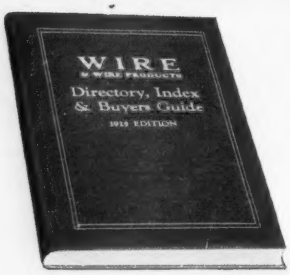

WIRE
& Wire Products

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ORDERS are now being filled for the second annual edition of the only reference work of its kind for bare and covered wire makers, fabricators of wire products, and sources of supply for wire and wire forming mill equipment.

Over eight hundred classifications, alphabetically arranged, cover everything used in the making and forming of all kinds of wire. The listings range from Abrasives to Zinc Wire.

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The second annual edition, greatly enlarged and improved, is the only complete and up-to-date directory of sources of supply for:

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The book is a handy size for reference, 6¼x9¼ inches, printed in clear type on heavy paper, bound in stiff boards and covered with dark cloth that will withstand the wear and tear of shop use without getting soiled. Postpaid anywhere in the United States on receipt of price, $5.00 a copy. Use the coupon below for convenience in ordering.

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City ..... State .....

(*Continued from page 205*)

lutely trustworthy measurements of at least the same degree of accuracy. This is particularly important for those plants in which the guarantee of a definite degree of Brinell-Hardness is required in the specifications of parts (such as springs, steel castings, etc.).

With the Busch-Schumann Projector, distributed by Paul F. Hermann Co., Keenan Bldg., Pittsburgh, Pa., the image of the Brinell-Ball-Impression, even when a lipped rim is produced, appears at once, magnified ten times and sharply focussed on a ground-glass screen as soon as the instrument is set up in the spot to be measured; so that the measurement can be read immediately and without trouble, with both eyes and with great accuracy; moreover the result, unlike that obtained with lens and measuring microscope appears with even edges and without any focussing.

The new device is about 12″ long. The projector with its interchangeable lower part is set upon the surface to be measured. The illuminator, which is incorporated in the instrument, lights up the surface so intensely, that the image is projected with very great clearness through the built-in objective on to the ground-glass screen arranged above it, on which then two diameters of the Brinell-impression can easily be read at once with an accuracy of 1/320 in. or greater with the help of the cross-scales on the ground-glass. The ground-glass with scale can also be rotated, so that now both diameters can be read quickly for any desired setting.

Measurement of this kind is carried out with extraordinary speed when compared with the former method and is at least of equal accuracy. In special cases the ground-glass images may be recorded photographically by the insertion of a photographic plate (sixe 3½″ x 2½″); the necessary accessories for this purpose are supplied separately.

Simplifies liquor copper coating

THE shorter the time wire is in the pickle the less likelihood of brittleness.

So before pickling make sure lime, soap or grease are broken down by Oakite.

Many wire mills have discovered that Oakite cleaning, before pickling effectively prepares wire for the liquor copper. A more even, adhesive coating or deposit is obtained which facilitates drawing. Less scratching or shoving up occurs.

Our nearest Service Man is prepared to discuss Oakite materials and methods with you without any obligation on your part. A postal card to us will bring him to you. Tell him your problems. Others have been helped by simple changes in cleaning methods and undoubtedly he can help you, too. Write us today.

Oakite Service Men, cleaning specialists, are located in all the leading industrial centers of the United States and Canada

Manufactured only by
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Industrial Cleaning Materials and Methods

VIANNEY

Famous Wire Drawing Diamond Dies

Made on a quantity production basis, in the largest die plant in the world, these dies, famous by their uniformity and accuracy of finish, can be delivered to you, at once, in small or large quantities, at very reasonable prices, from now on.

VIANNEY

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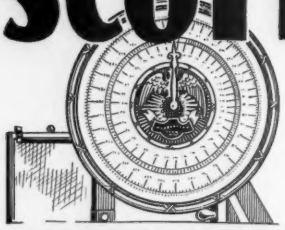
100 5th Ave., New York

SCOTT



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Give visible reading and graphic charts showing strength, stretch, elongation and action under stress. Used to establish standards governing purchasing and manufacturing.

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TESTERS

AMERICAN
PRESSED STEEL
REELS

PRACTICALLY INDESTRUCTIBLE
STANDARD TYPES 2½ IN. TO 8 FT.
SPECIAL TYPES MADE TO ORDER
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PULLEYS HANGERS HAND TRUCKS
MISCELLANEOUS STAMPINGS
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Proposed Tariff Act Will Affect Numerous Classifications of Wire Products

(*Continued from page 189*)

all other compounds and alloys of molybdenum, 50 cents per pound on the molybdenum contained therein and 15 per centum ad valorem.

(*g*) Ferrotungsten, metallic tungsten, tungsten powder, tungstic acid, and all other compounds of tungsten, 60 cents per pound on the tungsten contained therein and 25 per centum ad valorem.

(*h*) Ferrochromium tungsten, chromium tungsten, chromium cobalt tungsten, tungsten nickel, and all other alloys of tungsten not specially provided for, 60 cents per pound on the tungsten contained therein and 25 per centum ad valorem.

(*i*) Ferrosilicon, containing 8 per centum or more of silicon and less than 60 per centum, 2 cents per pound on the silicon contained therein; containing 60 per centum or more of silicon and less than 80 per centum, 3 cents per pound on the silicon contained therein; containing 80 per centum or more of silicon and less than 90 per centum, 4 cents per pound on the silicon contained therein; containing 90 per centum or more of silicon, and silicon metal, 8 cents per pound on the silicon contained therein.

(*j*) *Silicon aluminum, aluminum silicon, alsimin, ferrosilicon aluminum, and ferroaluminum silicon, 5 cents per pound.*

(*k*) Ferrochrome or ferrochromium containing 3 per centum or more of carbon, 3½ cents per pound on the chromium contained therein; ferrochrome or ferrochromium containing less than 3 per centum of carbon, and chrome *metal* or chromium metal, 30 per centum ad valorem.

(*l*) *Boron carbide, chromium carbide, vanadium carbide,*

WANTED: DIAMOND DIE POLISHER. MUST BE EXPERIENCED IN SMALLEST SIZES (.001 INCHES) AND LARGER. GIVE REFERENCES. ADDRESS LUDLUM STEEL COMPANY, DUNKIRK, N. Y.

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New way for re-inforcing the diamond.
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Factories { Trevoux / Les Abrets } France
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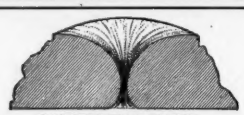

WATCH THE SHAPE
COCHAUD
Wire Die Corporation
Wire Drawing Diamond Dies
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Tel. Columbus 10148

Broden Construction Co.
Wire Mill and Cold Rolling Equipment
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CLEVELAND, OHIO.

A. WALDECK & COMPANY
WIRE GAUGES AND FINE STEEL WIRE DIES
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WANTED
Wire Cutters and Straighteners also Four Slide Wire Forming Machines.
JESSE ATHERTON
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chromium nickel, chromium silicon, chromium vanadium, and manganese copper, 25 per centum ad valorem.

(*m*) Ferrophosphorus, ferrotitanium, ferrovanadium, ferrouranium, ferrozirconium, zirconium ferrosilicon, ferroboron, *ferroaluminum vanadium, ferromanganese vanadum, ferrosilicon vanadium, and ferrosilicon aluminum vanadium, 25 per centum ad valorem.* [titanium, zirconium, chromium nickel, vanadium nickel, zirconium nickel, chromium vanadium, chromium silicon, zirconium silicon, calcium silicide.]

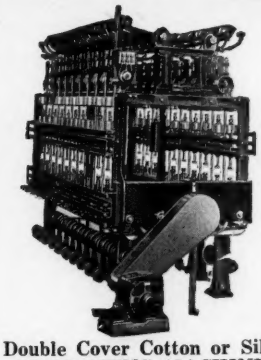
(*n*) *Barium, boron, calcium, columbium or niobium, strontium, thorium, titanium, uranium, vanadium, zirconium, alloys of two or more of these metals, or alloys not specially provided for of one or more of these metals with one or more of the metals aluminum, chromium, cobalt, copper, manganese, nickel, or silicon, 25 per centum ad valorem.*

[and]

(*o*) [all] *All* alloys used in the manufacture of steel *or iron,* not specially provided for, 25 per centum ad valorem.

Par. 390. Nickel oxide, 1 cents per pound; nickel, and [nickel alloy of any kind] *alloys (except those provided for in paragraph 302 or 380) in which* nickel is the component material of chief value, in pigs or ingots, shot, cubes, grains, cathodes, or similar forms, 3 cents per pound; in bars, rods, plates, strips, strands, castings, wire, tubes, tubing, anodes, or electrodes, 25 per centum ad valorem; and in addition thereto, on all [of] the foregoing, if cold rolled, cold drawn, or cold worked, 10 per centum ad valorem.

Par. [399] *398.* Articles or wares not specially provided for, if composed wholly or in chief value of iron, steel, lead, copper, brass, nickel, pewter, zinc, aluminum, or other metal, but not plated with platinum, gold, or silver, or colored with gold lacquer, whether partly or wholly manufactured, [40] *50* per centum ad valorem.



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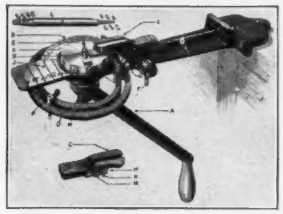
Forms Eleven Sizes of Eyes from Round, Square, Flat or Half-Round Stock, also almost any shape desired Quickly and Efficiently.
Adjustable for No. 3 to No. 24 Gage Wire.
The cut on the left shows a few of the thousands of the forms made on this
FORMER
Price $50.00



Patented April 2, 1918
Cleveland, Ohio, U. S. A.
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M. D. Kilmer & Co.

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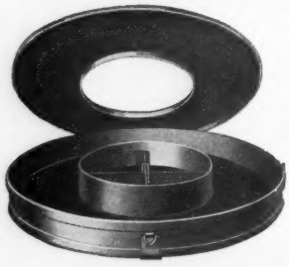

MADE of rust and corrosion-resisting alloyed steel. Electrically welded into a homogeneous unit. No rivets to loosen. Perfectly balanced. May be lifted by center hook that is welded to cross members. Made in any size . . . with or without cover.

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STEELSKIN BRAND
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For High or Low Carbon Wire
Working Samples sent on request.

Established 21 years.

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Office and Factory
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OUR WIRE MACHINERY CATALOGUE SENT ON REQUEST

Watch the Equipment and the Load

(*Continued from page 195*)

to come down off the hoist and unwind completely off the drum. This does not happen often on cranes, perhaps because the crane operator knows what he is doing and does not let it happen; but on hoists many times the rope comes completely off the drum and winds back in the opposite direction. This means that the limit stops of the mechanical brakes are entirely ineffective, and when the load is let down again the chances are there will be an accident.

On some of the latest designs of hoists a lower limit stop has been put on in addition to the upper limit stop, so that such an accident cannot happen; but practically all of the older hoists do not have a lower limit stop, and many of the accidents on hoists occur from this cause. Present day hoists are built very much the same as cranes, with all gearing enclosed, and with the parts arranged for easy inspection and maintenance.

In many plants if there was less of this business of everybody using the electric hoists, you would have less trouble with them; and in many cases it could be arranged so that one man would be responsible, at least for the care of the hoist.

Wire Gauze Patent Held To Be Novel

(*Continued from page 193*)

The Examiner takes the position that Caldwell has improved the old construction by the use of additional warp wires, whereas, appellant has made a corresponding improvement by the use of warp wires formed of material having increased wearing properties. We are not satisfied that the improvements are of like or similar character. While Caldwell has increased the tensile strength of his screen, it would not seem that he has increased its wearing quality, as has appellant. If ap-

pellant had done no more than substitute one material for another in forming his screen we would not regard the change as involving invention. However, it seems to us that the idea of using the more easily bendable weft wires of the old material in conjunction with the steel warp wires, thereby forming a smooth screen and yet one having marked improvements over prior art screens in wearing properties involves invention.

The claim presented in the brief is deemed patentable and if presented in a proper amendment we recommend its allowance. The claim on appeal, however, does not bring out the quality of the weft wires by virtue of which they are more easily bendable than the warp wires, and according we affirm the action of the Examiner in rejecting this claim.

Patent Decision Involves Radio Filaments

(*Continued from page 193*)

to the lack of evidence submitted to support this contention it was not sustained.

The plaintiff company at Bloomfield, N. J., is a manufacturer of electric lamps and radio tubes. It claims to be the owner of said letters patent and alleges that the defendant company, which is also engaged in the manufacture of radio tubes at Providence, R. I., has infringed and is infringing upon said patent in making its Type A tube. No other product of the defendant company is involved in this suit.

It is agreed that the general design and performance of the 201-A tube of the plaintiff and the Type A tube of the defendant are substantially the same. Each tube embodies a "hair pin" filament, taking the form of an inverted V surrounded by an elliptical plate with a grid interposed between the filament and the plate. Both tubes operate on a five to six volt one-quarter ampere current and give an emission of approximately 50 milliamperes. In fact, this type

"PREMIER"
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. . "Your Dies Are Very Satisfactory" . .

Says Wire Manufacturer

This manufacturer was so pleased with "Premier" dies that he sat down and wrote us about them.

Satisfactory service is insured by Driver-Harris' 20 years experience in drawing alloy wires.

"Premier" Diamond Dies draw true to expectation any metal in any size suited to diamond die drawing—with a marked decrease in interrupted production—repair work—and replacement costs.

Let us demonstrate the advantage of "Premier" Diamond Dies.

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WIRE DRAWING
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ROD FRAMES—16" FRAMES AND 8" FRAMES—TAKE-UP FRAMES
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CIRCULARS ON REQUEST

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Netting Pinions for Wire Netting Machinery

(For hexagon and triangular netting) made from a Special Steel of about 70—80 kg solidity, and

hardened Screws (bushes for same)

First class workmanship, in all sizes wanted, as per sample or drawing.

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The most improved metal composition die.

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STEEL SET

DIAMOND DIES

Highest Quality

Accurate Size Smooth Draw

URDIKA
WIRE DIE WORKS

105-107 Fulton Street New York City

(*Continued from page 211*)

of tube appears to be made by many manufacturers. In the trade the design 201-A has become substantially a generic or descriptive designation of a tube of a given type.

Neither the plaintiff nor the defendant was the first in the field in its manufacture. The plaintiff began the manufacture of radio tubes in the year 1921 and the defendant began its manufacture sometime in 1925. The plaintiff complains, however, that the patent here involved covers the thoriated tungsten filament used by it and that the defendant is also using a thoriated tungsten filament of substantially the same structure and composition.

The defendant uses a drawn wire filament which contains a small, but scientifically exact, quantity of thorium (excepting herefrom tubes purchased in June, 1926, made from another filament wire) in the manufacture of radio tubes which are not lamps but mechanical parts of a radio receiving set. These tubes are operated on a different current at only sufficient temperatures to produce electronic emission. Electrons, not ions or light, are the results desired.

This electronic emission is accelerated by a metallic thorium content and unaffected by thoria. Any incandescence present in the operation of the tube as an incident to the necessary heating of the filament is not utilized in its functioning. If there be present to any degree the so-called phenomenon of offsetting, it is not sufficiently marked to constitute a mechanical problem or generally speaking to affect the life of the tube.

The plaintiff asserts, nevertheless, that the use by the defendant outlined constitutes an infringement of its patent. To uphold such a contention, the court held, would not further, but impede the progress of the art. It would necessitate a disregard of the intendment of the patent law.

The bill of complaint was dismissed with costs.

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Vaughn Machinery Co., Cuyahoga Falls, O.

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Oakite Products, Inc., N. Y.

CRANES
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Waterbury Wire Die Co., Waterbury, Ct.

DIES—Diamond
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Bellet & Bouvard, N. Y.
Cochaud Wire Die Co., New York.
Detroit Wire Die Co., Detroit, Mich.
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Union Wire Die Corp., New York, N. Y.
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Urdika Wire Die Co., N. Y. C.
Vianney Wire Die Wks., N. Y.

DRAWING COMPOUNDS
Oakite Products, Inc., N. Y.

FURNACES—Wire Annealing
Vaughn Machinery Co., Cuyahoga Falls, O.

GAUGES—Wire
A. Waldeck & Co., Cleveland, Ohio.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

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M. A. Irmischer, New York.

MACHINERY—Electric Chain Welding
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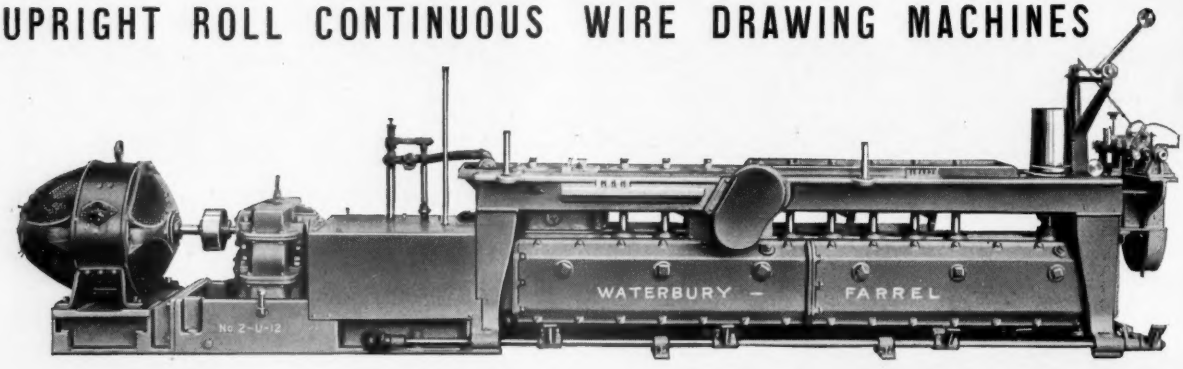

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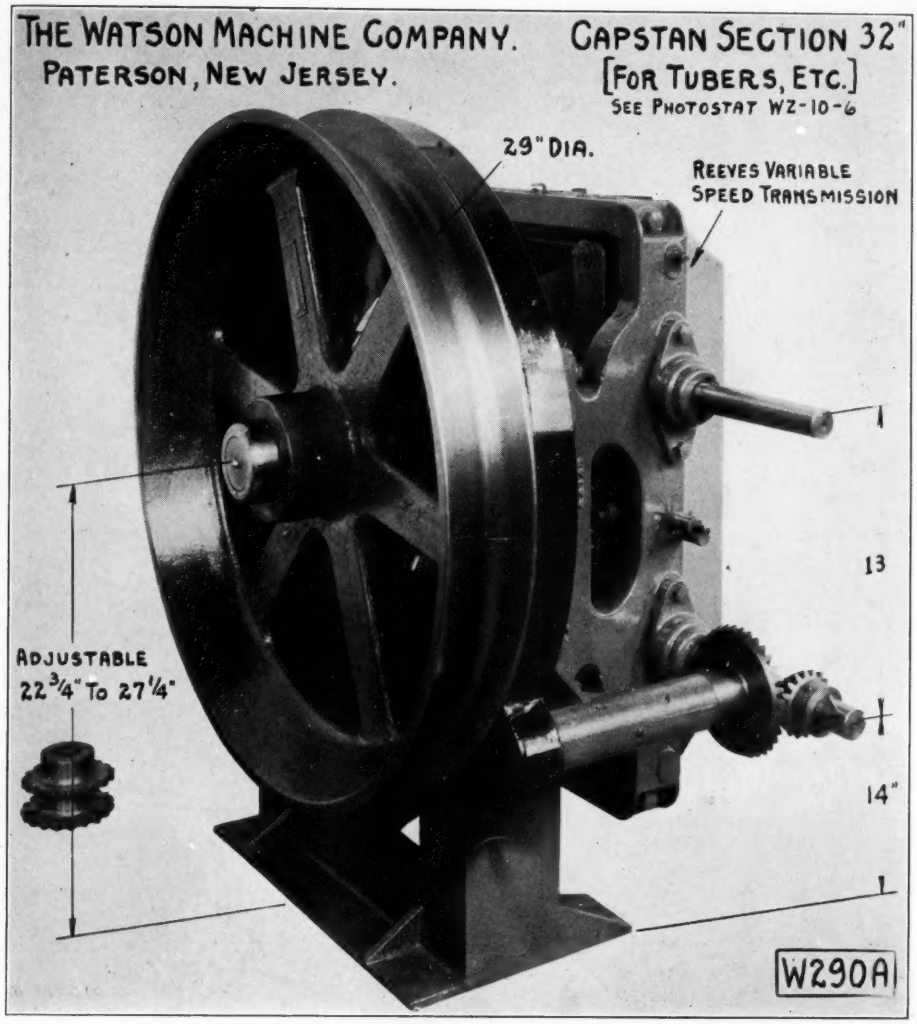

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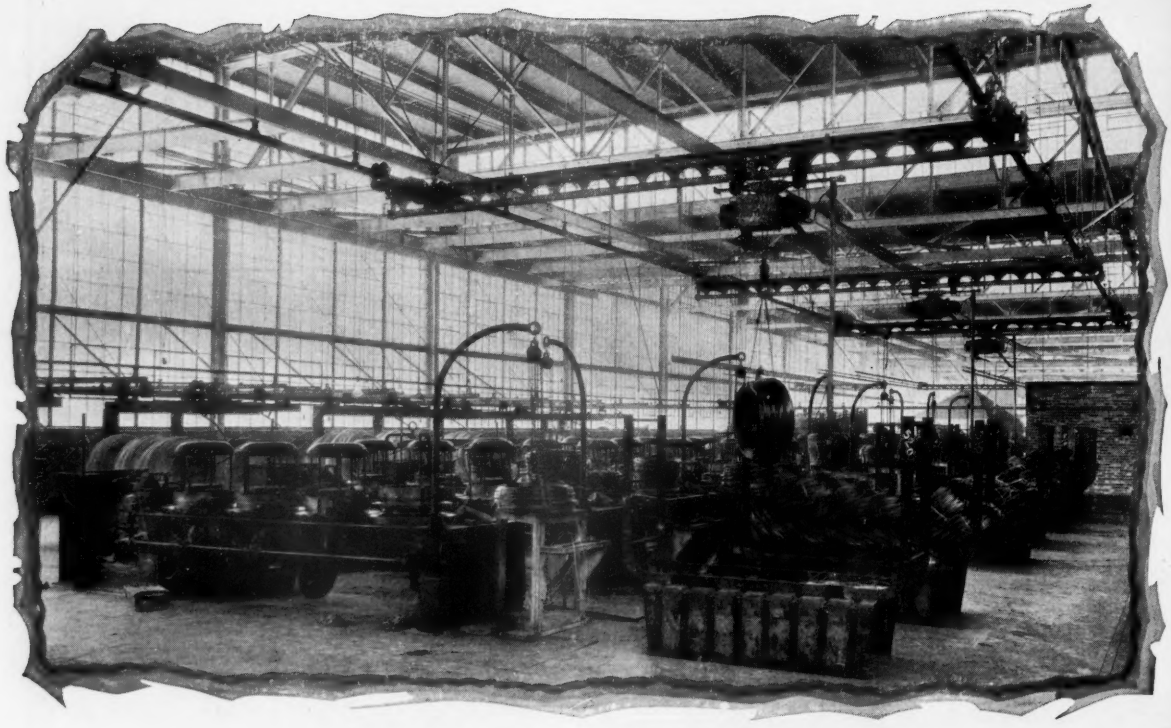

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